

AD-A032 216

RAND CORP SANTA MONICA CALIF

F/G 5/11

THE APPLICATION OF ECONOMIC ANALYSIS TO THE PLANNING AND DEVELO--ETC(U)

JUL 75 R J VAUGHAN

P-5609

NL

UNCLASSIFIED

| OF |

AD
A032 216



END

DATE
FILMED
1-77

AD A032216

FC

(2)

(6)
THE APPLICATION OF ECONOMIC ANALYSIS
TO THE PLANNING AND DEVELOPMENT OF
THE DELAWARE WATER GAP NATIONAL RECREATION AREA

10

Roger J. Vaughan

11

July 1975

12

87 p.

DDC
RECEIVED
NOV 18 1976
B

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

(14) P-5609 ✓

296600

(CC)

The Rand Paper Series

Papers are issued by The Rand Corporation as a service to its professional staff. Their purpose is to facilitate the exchange of ideas among those who share the author's research interests; Papers are not reports prepared in fulfillment of Rand's contracts or grants. Views expressed in a Paper are the author's own, and are not necessarily shared by Rand or its research sponsors.

The Rand Corporation ✓
Santa Monica, California 90406

THE APPLICATION OF ECONOMIC ANALYSIS
TO THE PLANNING AND DEVELOPMENT OF
THE DELAWARE WATER GAP NATIONAL RECREATION AREA *

By: Roger J. Vaughan

The Rand Corporation, Washington, D.C.

* Prepared in July 1975 for the National Park Service, Middle Atlantic Region, for planning and development of the Delaware Water Gap National Recreation Area.

ACCESSION for		
NTIS	White Section	<input checked="" type="checkbox"/>
DIC	Buff Section	<input type="checkbox"/>
UNANNOUNCED		
JUSTIFICATION		
BY		
DISTRIBUTION/AVAILABILITY CODES		
Dist.	AVAIL. and/or	SPECIAL
A		

PREFACE

This paper is offered, not as the result of detailed empirical research, for, all too often, the necessary data are unavailable, but rather as a contribution toward the development of planning techniques for recreation projects.

While the National Park Service has prepared analyses of the economic impact of recreation areas, these have failed to address the issues and questions for which economics is best suited. It is the author's contention that the framework of cost-benefit analysis, when properly applied, can be used to uncover information that can greatly improve the efficiency of recreation planning. By outlining the ways in which such calculations can be made, one can identify the necessary data on which such decisions are based. Through this discussion can be laid the foundations for the future contribution of economics to recreation development.

This paper is hopefully accessible to both recreation planners and economists and should contribute to the dialogue between the two professions.

ACKNOWLEDGMENTS

The author has benefited from discussions with many people, none of whom should bear the responsibility for remaining errors and confusions. Especially, he would like to thank J. Robert Stottlemeyer, Chief Scientist of the Mid-Atlantic Region of the National Park Service; William Kornblum of the Cooperative Park Studies Unit at the Graduate Center, City University of New York; and Lenore Robinson, a sociologist conducting parallel research for Delaware Water Gap National Recreation Area.

SUMMARY

While there are insufficient data to reach any detailed planning and development conclusions concerning Delaware Water Gap National Recreation Area (DWGNRA), an examination of some of the problems from the perspective of economic theory can lead to some insights concerning the provision of recreation services at DWGNRA.

Economic analysis has not been fully utilized in recreation planning. This has resulted from the difficulty of defining what is meant by recreation and also because outdoor recreation has traditionally been provided for by the public sector and, therefore, detailed economic analyses have been regarded as unnecessary. The rapid expansion in use of public open space and the growing scarcity of land dictates that increased emphasis be placed upon the efficient provision of recreation services to urban America.

A comparison of costs and benefits cannot be used as the sole criterion for recreation planning for three reasons. First, some of the benefits and costs cannot be measured in dollar terms. Secondly, public projects involve the redistribution of income between different segments of the population. A dollar of cost to one individual cannot be directly compared with a dollar of benefit to another. Thirdly, the government has multiple goals in the provision of recreation services, including not only efficiency, which is met through meeting cost-benefit criteria, but also equity and income redistribution toward target groups. However, although supplementary information and a degree of subjective judgment must also be used, cost-benefit analyses may be used to provide a valuable input into decisionmaking.

BENEFITS

There are three principal components to the benefits to society as a whole of a project like DWGNRA.

User Benefits

First, and most important, is the value to those who use the area for recreation. The value that recreationists place upon a visit can

be assessed by observing the relationship between the distance that they travel and the frequency of their visits. This relationship can be used to derive a demand function. A "reasonable" estimate for DWGNRA would place it at \$1.25 per visitor, or \$4.25 million per annum when a peak of 3.4 million visits is reached. This value is likely to increase over time as population and incomes rise over time, until capacity constraints are reached. At this point pricing can be used to regulate visitor level on peak days in order to preserve both the park environment and the quality of the recreation experience for visitors.

The rate at which the level of visits expands also depends upon the age of the park, and it is possible that, during its early years, DWGNRA will experience a relatively fast rate of growth of visits as the local population learns of its existence.

Local Benefits

DWGNRA will enhance the value of property nearby; farmland will gain in value as areas for potential campsites; commercial property will also become more valuable as the local population grows and sales increase; residential property will increase, reflecting the attractiveness of the area as summer homes. These increases should be added to the user value.

Indirect Benefits

In addition to the direct benefits outlined above, DWGNRA will have indirect benefits. The level of congestion at competing recreation areas and along routes to these areas will be reduced. Since this congestion has a negative social value, its reduction must properly count as a benefit. The availability of additional recreational opportunities may also have some indirect social benefits--for example, reducing crime and other anti-social behavior--although there is no conclusive evidence on this score.

COSTS

There are three components to the costs of DWGNRA.

Planning and Development Costs

The costs of acquiring the land (measured as its value in its most profitable alternative use) and of planning and developing the area are probably the largest component of costs.

Maintenance Costs

It is important to estimate, in advance, the likely level of maintenance expenditure necessary to preserve the park as a viable recreation area. The necessary expenditure is a function of the number of visits; therefore, a prediction of the demand function, as well as data from other parks from which the relationship between visits and maintenance costs can be estimated, is needed.

Indirect Costs

There are several types of indirect costs which should properly enter the calculation at the planning stage. Entering them is necessary not simply to estimate whether or not the park is worthwhile, but to identify those segments of the population likely to be harmed so that effective redress can be achieved. Those living near busy approach routes and new commercial developments and paying higher property taxes may regard the park as harmful. They can be effectively compensated through a reduction in their property tax rate. Similarly, those who gain an unfair proportion of the benefits, including those making large capital gains on their property, can be taxed proportionately heavier.

A direct comparison of benefits with costs must be made at one point in time. Future benefits and costs must be discounted to the present for a meaningful evaluation of alternatives. A cost-benefit analysis is not limited to the project as a whole, but can be performed for separable parts of the project--an access road, a sports facility, or an extension to a beach area.

The regional and local costs and benefits can be analyzed within the same structural framework as those for society as a whole. The problem of inequity is more likely to arise between different socio-economic groups than between regional population groups because the

region will probably have a higher benefit-to-cost ratio than the nation as a whole. However, certain local residents should receive special consideration during the planning process.

Timing the development of a recreation facility must be related to changes in demand. The benefits of delayed development are the saved interest payments on capital, and the costs are the value the additional capacity would have had to users. The ability of local government to provide for the necessary support facilities may provide additional constraints. Timing should also be changed to reflect the amount of unemployment in the local construction sectors; when unemployment rises, development should be accelerated. A possible advantage of moderately paced development is that it allows for more flexible planning based upon actual, rather than predicted, use patterns.

DATA REQUIREMENTS

Data are needed in several major areas in order to plan the development and administration of DWGNRA.

Visitor Samples

Surveys should be taken of visitors to gain information on their home location, socioeconomic status, and the type of recreation facilities they used. These surveys should be taken at all national parks on a regular basis, preferably annually or biennially.

Visit Distribution

Data at each recreation area should be assembled on the distribution of visits on different days during the year and between particular locations and facilities within the park.

Regional Data

Information concerning the socioeconomic attributes of the areas surrounding the recreation area should also be collected, including employment by industry (by county), income, population level, and age distribution. This data would provide information on the base

population from which users will be drawn. The data would also include detailed information on the fiscal behavior of local governments.

Park Management Data

Park managers should supply data on an annual basis on maintenance costs, facility availability and use, visitor behavior patterns, and fire damage. These four data sets would be assembled in machine readable form in compatible files for each park in the National Park System (NPS) and updated annually. This would enable detailed time-series and cross-sectional analyses to be carried out to provide information to assist planning decisions.

PUBLIC SERVICES FOR A RECREATION AREA

Because of the inflexibility of park budgets, and also because of the lack of expertise in some areas, increased reliance should be made on private-sector funds to assist in the development of recreation areas. There are several areas where such an approach would be productive.

Transportation to a Site

The NPS must actively plan to deter the use of the automobile as a means of transportation to a park. Congestion is a serious problem in many areas, and the air and noise pollution associated with automobile travel aggravate the problem. The automobile is best controlled through entrance fees and parking charges, but cooperation with surrounding communities is necessary if they are not to become parking lots. With the revenue generated from these charges (less collection and enforcement costs), together with revenues from gasoline taxes made available from the Urban Mass Transit Administration (UMTA), public transportation can be subsidized. Use might be made of the idle weekend-capacity of bus fleets in nearby towns. If outside equipment can be used, then the NPS will save on the capital cost of the equipment and on personnel training costs.

Transportation within a Park

Special vehicles are likely to be needed to distribute users among developed areas within the park. Because of the popularity of the automobile, its use can probably be curtailed only by limiting it to certain areas within a park. The use of special buses would reduce the costs associated with providing for the family automobile--wide roads and numerous parking spots.

Fire Protection Services

At present, no contractual arrangements are possible between the NPS and local fire stations. In less remote parks, it may not be necessary for the NPS to develop its own fire service, since an adequate level of protection could be gained from a local municipality at a fraction of the cost. Rather than imposing costs on the local government for this service, the NPS should be able to subsidize the additional capital equipment and manpower that might be necessary. A similar principle applies to medical services.

Other Services

Concessions and leases can be used to mobilize private funding. Care must be taken to select the appropriate arrangements for different types of activities, including restaurants, hotels, sports facilities and retail outlets. A review of past NPS concession experience would provide some valuable guidelines for the future. The system by which parks are planned and administered must be changed to provide the local manager with an incentive to apply good business management techniques. Increased demand should be reflected in increased revenue, which in turn should lead to expanded capacity.

RECREATION IN AN URBANIZED SOCIETY

The need for a reform in the way that recreation needs are met is growing. Preservation alone cannot provide for a growing urbanized population. Recreation services must be provided where people live--within, or adjacent to, large population centers. Inter-governmental

cooperation, both laterally and horizontally, must be improved. Recreation services must be thought of as a system--from wilderness trails to outdoor concerts. The plight of some large cities makes it imperative that action be taken now to rationalize the planning process through which recreation can be supplied to the broadest possible spectrum of society.

CONTENTS

PREFACE	iii
ACKNOWLEDGMENTS	v
SUMMARY	vi
LIST OF TABLES	xvii
LIST OF FIGURES	xix
Chapter	
1. RECREATION PLANNING AND ECONOMIC ANALYSIS	1
Unmeasurable Costs and Benefits	2
Income Redistribution	3
Multiple Goals	5
Implications	7
2. COSTS AND BENEFITS OF A RECREATION AREA	10
The Value of the DWGNRA	10
User Benefits	11
Local Benefits	23
Indirect Benefits	23
Planning and Development Costs	25
Operating and Maintenance Costs	26
Indirect Costs	27
Summary	28
Comparison of Cost with Benefits	29
Benefits	29
Costs	29
Regional and Local Costs and Benefits of the DWGNRA	30
The Timing of Project Development	32
Data Needs and Availability	34
Preferences for Outdoor Recreation	34
Types of Visits	40
Capacity	42
3. PUBLIC VERSUS PRIVATE RESPONSIBILITY FOR RECREATION ...	46
The Use of Private Sector Resources	46
Budget Inflexibility	46
Economies of Scale	48
Transportation to the Recreation Site	49
Discouraging Automobile Use	50

Providing Public Transportation	52
Transportation within the Site	55
Fire Protection Services	56
Medical Facilities	56
Other Services	57
Conclusions	58
4. RECREATION IN AN URBAN SOCIETY	62

LIST OF TABLES

TABLE 1: USER POPULATION AND COSTS FOR THE DWGNRA	14
TABLE 2: ANNUAL DEMAND FOR VISITS TO DWGNRA	17
TABLE 3: FACTORS LIKELY TO AFFECT RECREATION BEHAVIOR	35
TABLE 4: DATA REQUIRED TO ESTIMATE DISAGGREGATED DEMAND FUNCTIONS	41
TABLE 5: ADMINISTRATIVE DATA TO BE ASSEMBLED FOR EACH PARK ANNUALLY	43
TABLE 6: COUNTY DATA TO BE ASSEMBLED AROUND EACH PARK	44
TABLE 7: PERCENT OF POPULATION AND PERCENT OF PARTICIPANTS IN OUTDOOR RECREATION ACTIVITIES BY INCOME GROUP (JUNE, JULY, AND AUGUST 1972)	64
TABLE 8: MUNICIPAL PARKS - AREAS, EXPENDITURES, AND EMPLOYEES SELECTED CITIES: 1960 AND 1970	66

LIST OF FIGURES

FIGURE 1: THE DEMAND FOR PARK VISITS	12
FIGURE 2: DEMAND FUNCTION FOR DWGNRA	18
FIGURE 3: EXPANSION IN USE OF RECREATION FACILITY OVER TIME	20
FIGURE 4: INDEX OF VISITS TO FOUR NATIONAL PARKS, 1970 = 100	22
FIGURE 5: AGGREGATION OF GROUP DEMAND FUNCTIONS	39

Chapter 1

RECREATION PLANNING AND ECONOMIC ANALYSIS

Economic analysis can be used to provide valuable information in making recreation planning decisions. In spite of appeals made more than a century ago by the designer of Central Park, Frederick Law Olmsted--and of several calls since--economics has not been widely applied in the area of recreation.¹ Land use decisions are still made on the basis of untested "standards" and political "ad hoc" policy."

There are several reasons for this neglect. First, there is no clearly measurable output. A "visitor-day" has less substance to it than a bushel of wheat or a 175-horsepower automobile. Second, the public sector has been relied upon to provide for recreation needs. Since resources are usually financed through taxation, they have rarely been priced, and there has been no need for federal, state, and local governments to engage in rigorous analysis of recreation needs and methods. Third, there has long been a belief that recreation is somehow a luxury good and that attention should be focused first upon society's more "basic" needs. Lastly, there has been confusion in the definition of recreation. The poet William Cowper wrote that "God made the country and man made the city," and echoes of this belief are implicit in many recreation policies. Meeting recreation needs has been confused with preserving natural areas, often in sites far from population centers. Natural areas are very necessary both for the legacy of the nation to be passed on from generation to generation and for certain forms of recreation, including nature walks,

¹There are some striking exceptions. For example, see work of Marion Clawson, Robert Kalter, Jack Knetsch, John Krutilla, Boyd Wennergren, and staff members of the Urban Institute, the National Recreation and Park Association, Resources for the Future and the Regional Plan Association. The first extensive analysis of recreation demand functions, coupled with cost benefit analysis has been carried out in the Bureau of Outdoor Recreation, *Survey of Recreation, 1972*, Appendix A. While this is a major step forward, its results cannot be directly applied to park planning decisions.

backpacking, hunting and camping. However, these activities form only a small part of a kaleidoscope of ways in which the modern family fills its leisure. As Frederick Styles observed, "traditional outdoor recreation activities--such as hunting, camping, backpacking, and even fishing--may soon involve such a small proportion of the population as to raise serious questions regarding the validity of public expenditures for these purposes."² Providing for outdoor recreation needs involves developing a *system* of open spaces, ranging in size and commitment from forest preserves of hundreds of thousands of acres to neighborhood play lots.

As a result of the sparse application of economic analysis, there is confusion over its role in recreation planning. Properly, economics applied to public-project evaluation is concerned with efficiency, either the cost-minimizing way of achieving a given target or the benefit maximizing allocation for a given budget. Both these approaches involve a comparison of the benefits that result from the construction of a park, a lodge, or a similar project--with the cost of the resources involved, or cost-benefit analysis. Economic theory provides a set of criteria that are used to determine the way in which costs and benefits should be measured. An economist will approve of any project for which the total of all the benefits exceeds the total of all the costs.

While this may seem an unambiguous and objective criterion for project planning, a criterion on which the politician and public administrator could easily agree, unfortunately it is not. There are three reasons why cost-benefit analysis must be augmented by further types of analyses and by subjective judgment.

Unmeasurable Costs and Benefits

First, not all the costs and benefits resulting from a project can be measured. For example, it is frequently asserted that the use of outdoor recreation facilities lowers the propensity toward crime

²In B. L. Driver, ed., *Elements of Outdoor Recreation Planning*, University of Michigan Press, 1970, p. 52.

and anti-social behavior. There is no evidence for this and no way of assessing the dollar value of this potential benefit. There are several examples of such intangibles--better physical and mental health resulting from participating in recreation and the attractive vistas that open space provides are just two "external" benefits.³ The importance of "unmeasurables" is waning. In 1951, Marion Clawson concluded that the value that visitors place upon a recreation experience was basically unmeasurable. However, by 1959, he had published estimates of the demand functions for visits to some National Parks. As the science of economics progresses, so does the economist's ability to measure the previously unmeasurable.

Income Redistribution

Second, and more important, is the fact that a public project involves the redistribution of income. When a consumer purchases a suit from his tailor he exchanges money, which has a known exchange value, for a suit that he values at least as much. The tailor surrenders the fruits of his labors for the money. Both probably feel satisfied with the exchange and the social impact is limited to the two participants. If the same individual visits a nearby park, the situation is quite different. He pays nothing, or perhaps a token fee, for the privilege, and the cost is borne by many taxpayers.⁴ No one subsidized his coat, but many people have contributed toward his enjoyment of the park. There are many direct and indirect subsidies and transfers involved in a public recreation project. The economist tends to look only at the benefits and costs to society as a whole, ignoring transfers between groups within society. However, these transfers are important in determining the political feasibility of the development and, ultimately, its success. These

³These are discussed more fully in another paper by this author, *The Economics of Recreation: A Survey*, p. 5301, The Rand Corporation, September 1974.

⁴Through property taxes if it is a local park, income taxes if it is a federal park.

transfers must be identified and examined, and, hopefully, a basis developed for providing a remedy for those who bear an excessive fraction of the costs. This compensation might come from the pockets of those who gained more than their share of the benefits.

There are, therefore, a myriad of possible cost-benefit studies, one for each person affected by the project. Consider the following cases as examples of individuals who become net losers or net gainers as a result of a park:

- (a) The farmer who owns 50 acres adjacent to the park that can be developed as a campsite and who sells his land for \$10,000 profit.
- (b) The farmer who finds his fields bisected by a park access road and his land spoiled by run-off and damaged drainage.
- (c) The resident in a small town nearby whose peace is disturbed when automobile traffic increases ten-fold.
- (d) The merchant in the small town whose profits quadruple when business increases from holiday traffic.

Although a social cost-benefit analysis is performed for a recreation project and these costs and benefits fully accounted for, and the area appears worthwhile, the fact remains that there are many individuals for whom the park is not a blessing. A full economic impact analysis should include a discussion of these groups and estimates of the magnitude of the excess cost (or excess benefit) that they bear. There are many public policy instruments that can be finely tuned to provide redress. For example, the amount of property taxes collected from those particularly affected can be modified--reduced in cases where costs are excessive, or increased in cases where benefits are large; lump-sum payments in compensation can be made; plans can be modified. But the appropriate steps can only be taken if the proper planning and research are carried out in advance, and if the necessary data are available.

Such analysis is also needed if the planning process is to survive public hearings and local political pressure. For example, a park may be valued by its users, who are drawn from a very wide area, at \$4 million per year (or \$2 per user-day if there are 2 million visitors). The costs, borne in part by the federal government and in part by the local communities, may be only \$3 million per year. Society as a whole is richer for the park. However, the costs may be borne disproportionately by some members of the local communities. Higher property taxes may be levied to rebuild and repair local roads or to pay for a hospital extension for injured vacationers or for an extra fire engine. There might be congestion on local streets and noise and unsightly commercial development. These local residents will be more willing to attend meetings and organize local activities to oppose the park. They, individually, have more to gain from stopping the park than users have from promoting the park. It is quite possible that local communities could impose considerable costs upon society at large by thwarting development.

Multiple Goals

The third reason why a simple comparison of costs and benefits cannot be used as the sole decision criterion is the multitude of goals toward which a project is aimed. If the sole purpose of the development of a park were the efficient provision of recreation services, then a relatively straightforward cost-benefit calculation would be a powerful guide. However, implicitly or explicitly, the development of a recreation area has many other purposes. These include:

- (a) Preservation of natural environments;
- (b) Redistribution of resources to target income, geographic, ethnic, or age groups;
- (c) Guiding regional economic development;
- (d) Influencing the distribution of population; and
- (e) Flood control and soil preservation.

Even the goal of meeting recreation needs has complicating aspects. Are the needs to be met those expressed by the public in their current reactionary behavior, or should some attempt to be made to educate the public by leading them toward constructive or productive uses of their leisure time. Styles obviously favored the latter approach when he asked,

What are our goals in recreation and how do they relate to the broad goals of our society? Are we to react to fads, are we to relate recreational opportunities to the lowest common denominator in terms of desires, or are we to provide some positive direction in our programs?⁵

Planning in this way obviously implies the judgment that planners know better than users what is good for society. Yet there is little empirical evidence on which such an expert's prerogative could be based. Little is understood concerning the impact of alternative patterns of recreation behavior upon other socially relevant action. Herbert Gans summarized the opposing attitude toward recreation when he wrote,

Leisure behavior is subjective, and leisure cannot be planned or planned for. All that government and commercial agencies can do is to plan recreation facilities with the intent, and hope, that they will be attractive enough for people to use them in leisure behavior.⁶

Unfortunately, these goals are rarely compatible, and planning and development involves making a series of complex trade-offs. The more research concerning the impact upon these goals of alternative types of development, the more effective will be the decisions made.

⁵In B. L. Driver, op. cit., p. 51.

⁶Herbert J. Gans, "Outdoor Recreation and Mental Health," in *Trends in American Living and Outdoor Recreation*, ORRRC Study Report 22, Washington, D.C., 1962, p. 236.

Implications

The lesson to be drawn from this simplified discussion is important for the structuring of economic analyses of recreation projects. The goals of such research must be the identification of the costs and benefits to society as a whole, but especially to subgroups affected by alternative policy decisions. This approach can be applied to a macro-analysis of the entire recreation project, or a micro-analysis of subprojects--a campsite, a lodge, or a public transportation link-up.

While this may seem like a straightforward conclusion, a brief history of economic studies of recreation projects reveals that it is far from being the accepted and most widely practiced approach by recreation planners.

The extensive projects carried out by the Army Corps of Engineers, the Tennessee Valley Authority, and the W.P.A. during the late thirties were often aimed as much at providing work and stimulating depressed areas as at providing recreation facilities.⁷ The issue was less the cost effectiveness of the parks themselves, but their contributions toward increased economic activity in the regions. Economic-impact studies measured the gross volume of business that might result from the parks.⁸ These studies were attractive because the data was relatively easy to collect,⁹ and the resulting dollar numbers were generally

⁷ Indeed, there are still many recreation projects that are carried out as public works and designed to stimulate employment in depressed areas.

⁸ For a partial list of studies of this form, see Marion Clawson, "Methods for Measuring the Demand for the Value of Outdoor Recreation," *Resources for the Future*, Reprint No. 10, February 1959, footnote 5. See also J. A. Mahony, "Economic Evaluation of California's Sport Fishery," *California Fish and Game*, Vol. XXXVI, April 1960, E. W. Swanson, *Study of the Impact of National Park System Travel in the National Economy*, North Carolina State University, 1960, and several studies conducted for the National Park Service, including George F. Leamer et al., *The Economic Impact of Organ Pipe Cactus National Monument*, University of Arizona, 1970, and William B. Beyers, *An Economic Impact Study of Mt. Rainier and Olympic National Parks*, University of Washington, 1970.

⁹ For example, the *Census of Selected Service, Retail and Wholesale and Manufacturing*, performed every five years by the Department of Commerce, and the *County Business Patterns*, published annually, provide useful data for these calculations.

large. While this information may be a first stage in a cost-benefit analysis, it does not, in itself, provide criteria useful in the formulation of planning decisions. The fact that a park will cause \$5 million to be spent on food, gas, and lodging in the immediate vicinity each year does not mean that the park is worth \$5 million a year, any more than annual sales of \$5 million guarantee a profit to a manufacturing concern. These services cost money to supply; land use patterns change; and people are displaced. The issues of costs and benefits are not addressed, either at the aggregate or the local level in this type of analysis.

In 1952 the change in the federal administration "resulted in there being exhibited in Washington a marked preference for having more of the nation's economic functions carried out in the private sector."¹⁰ In marked contrast with the New Deal era, a measure of justification for public intervention had to be sought.

Several of the initial attempts lacked a firm, analytic basis to quantify the value of recreation experiences. The U.S. Forest Service used "planning prices," which it was hoped would "measure the amount that users would be willing to pay if such payments were required to avail themselves of the project recreation resources."¹¹

Questionnaires have also been used to ask recreationists how much they value their experiences. However, the amount of freedom that such surveys allow respondents, since no actual monetary obligation is attached, may be too large to allow any confidence to be placed in the resulting values.

Another approach that has been tried has been to use the price charged for comparable recreational facilities by private clubs or other commercial enterprises. However, for many projects there are

¹⁰ John V. Krutilla, "Is Public Intervention in Water Resource Development Conducive to Economic Efficiency," *Natural Resources Journal*, Vol. 6, January 1966, p. 61.

¹¹ Quoted by R. J. Smith and N. J. Kavanagh, "The Measurement of Benefits of Trout Fishing: Preliminary Results of a Study at Grafham Water, Great Ouse Water Authority, Huntingdonshire," *Journal of Leisure Research*, Vol. 1, No. 4, 1969, p. 319.

no comparable "market" alternatives. A private club often offers a qualitatively different type of service. A tennis game at a private club will involve less waiting time, a smooth court, and auxiliary services such as a club room and showers.

It was not until the late 1950s that attempts were made to use recreationists' actual behavior as a way of measuring the value of recreation opportunities. The methods are discussed in more detail in the following chapter.

The need for improved efficiency in recreation planning increases each year. Population growth and population urbanization have placed a considerable strain upon the National Park system and upon local governments. Visits have grown much more rapidly than acreage. This mismatch is discussed more fully in the final chapter below.

By improving the availability of the data and the tools of analysis by which recreation planning decisions are made, the increasingly scarce supply of recreational open space can be used to meet society's needs more effectively. Too often in the past, failure to coordinate data collection on a rational and nation-wide basis and to use the most effective analytic tools developed in the social, biological and information sciences has led to ineffective and inefficient decision-making.

Chapter 2

COSTS AND BENEFITS OF A RECREATION AREA

This chapter is divided into four main parts. In Section 1, the costs and benefits of the DWGNRA from the point of view of society as a whole are examined. This approach helps determine whether or not the area merits development as a facility to meet the recreation needs of people living nearby.

In Section 2, costs and benefits to specific population groups are considered. These analyses help identify those who will benefit or pay more than their share. This is an essential stage in planning because these are the groups whose needs must be anticipated and for whom special provision should be made.

In Section 3, the issues relevant to the timing of the development of DWGNRA are analyzed.

In the final section the general lessons for analysis are distilled, and specific recommendations concerning the way in which data should be compiled are made. Comparison with available statistics shows the inadequacy of the economic and social data on which planning decisions are presently made.

THE VALUE OF THE DWGNRA

There are several components of both the benefits and costs of a recreation site that must be considered. The benefits can be divided into three components: (a) the value of the park to the users; (b) the increase in the value of surrounding land; and (c) indirect benefits enjoyed by non-users of DWGNRA, including the value of reduced congestion at competitive sites.

Costs, similarly, have three components: (a) the cost of development (including land purchase); (b) the cost of maintenance and repair; and (c) indirect costs borne by non-users--for example, the noise and congestion imposed upon nearby residents.

Methods for measuring the magnitudes of each of these components are discussed in the following subsection.

User Benefits

The major value of the DWGNRA will be to its users. The value of a visit is the maximum amount that the visitor would be willing to pay in order to gain admission to the area if it were necessary. This varies from user to user. A resident of adjacent Sussex County visiting the area for a brief picnic on a summer evening would probably be deterred by even a modest admission cost. Someone driving from Philadelphia or New York City, and planning to spend a full weekend, would be prepared to incur a much higher admission.

The tastes and financial resources of those served by the park also affect the amount they would be willing to pay for admission. Low income households may not be willing to spend as much, preferring to use their financial resources to satisfy more basic needs. Families without children, people with large backyards of their own, or the elderly may not use the area as much as other population groups.

Demand: The relationship between the total number of visits made to the park during a given time period and the willingness to pay, as measured by the hypothetical admissions prices, is known as the demand function. Figure 1 illustrates this concept. The admission price is measured on the vertical axis, and the number of day visits is measured along the horizontal axis. The line DD' measures the functional relationship between price and number of visits. For example, at admission price P_1 , Q_1 visits would be made in the specified time period.

The area under this curve measures the total value of the visits. If no admission price is charged, then users valued the park at the area ODD'. For example, if the functional relationship is linear, and if the maximum that anyone would pay for admission were \$10, and there were 2,000,000 visitors per year, then the value of the recreation service provided at DWGNRA would be \$10 million.

Unfortunately, there is no direct data from which estimates of the demand function can be made. Parks have not systematically varied their admission charges and recorded the impact upon the number of visits. Instead, an indirect way of measuring users' willingness to

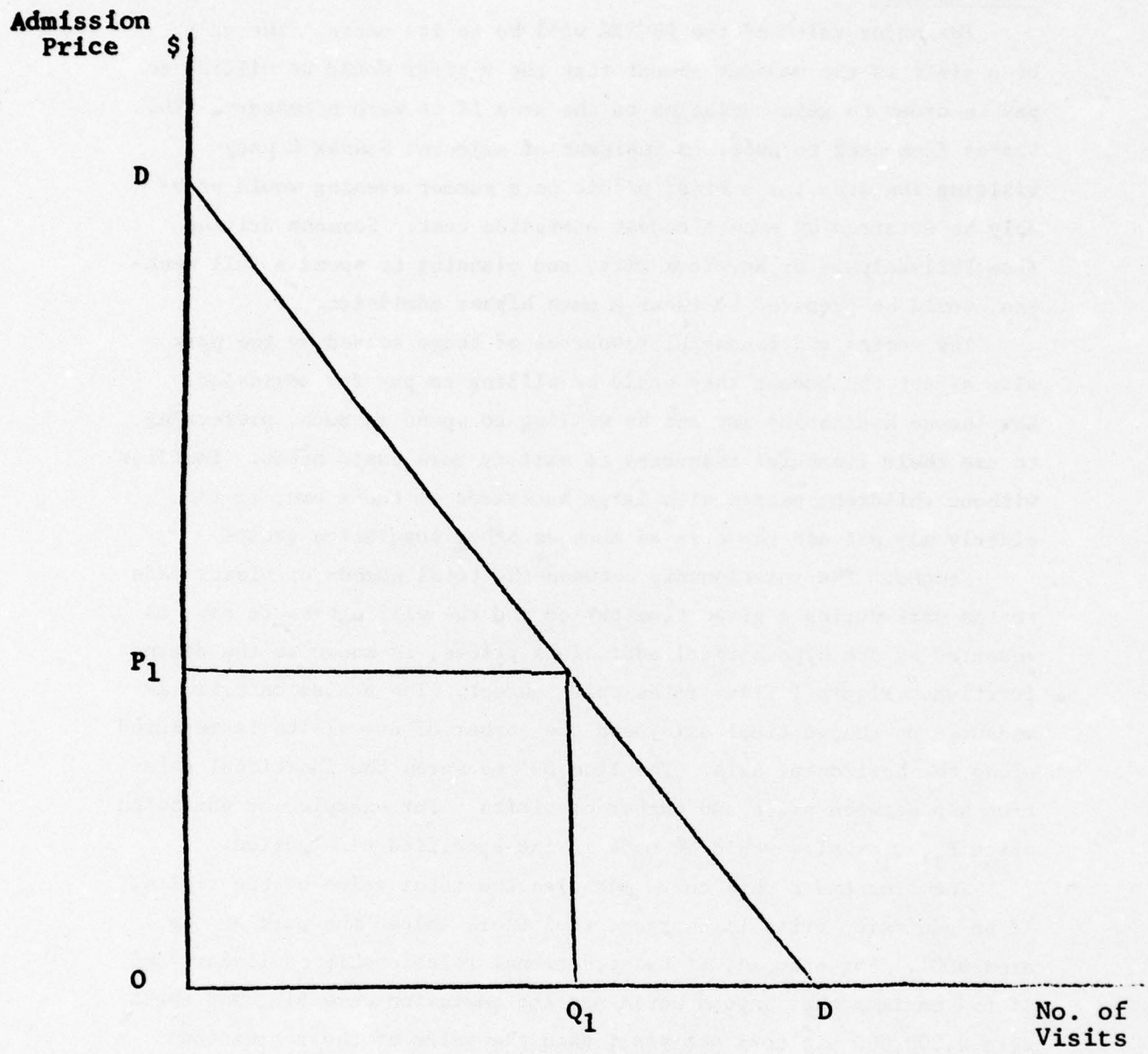


Figure 1. THE DEMAND FOR PARK VISITS

pay has been developed by Clawson based upon a suggestion by Hotelling.¹

The basic approach is to use the relationship between the frequency with which a household or members of a community visit a recreation area and the distance that must be travelled. Unlike most commodities that consumers purchase, outdoor recreation must be "consumed" at certain sites. It cannot be stored in the house to be enjoyed when needed. The costs of reaching these sites is a major part of the price that must be paid for the pleasure. Also, different households face very different "prices" for recreation in terms of travel costs. Inner-city residents must travel considerable distances before they can reach an outdoor recreation site. People living in Sussex or Pike counties need only endure a short trip before they can use DWGNRA.

These unique attributes of outdoor recreation enable the demand function for a site to be estimated even without any market information on prices and quantities. Unfortunately, the necessary data, the frequency of visits as a function of distance, are not available for DWGNRA. An accurate measurement of the demand, or user value, of the area is, therefore, not possible. However, data are available from other sites, and as a way of both illustrating the technique and of arriving at a reasonable estimate of the value of visits to DWGNRA, the demand function is estimated below.

The population served by the DWGNRA lives in the tri-state region of Pennsylvania, New York, and New Jersey. Counties were clustered into five groups according to their distance from the recreation area in order to use readily available data.² Table 1 shows the population totals within each distance zone.

¹Marion Clawson, "Methods for Measuring the Value of and Demand for Outdoor Recreation," *Resources for the Future*, Report No. 10, 1959, and Hotelling, reported in Roy Prewitt, "The Economics of Public Recreation: An Economic Study of the Monetary Evaluation of Recreation in National Parks," *Miscellaneous Paper, National Park Service*, mimeo, 1949.

²U.S. Department of Commerce, Bureau of the Census, *County and City Fact Book*, 1972.

TABLE 1. USER POPULATION AND COSTS FOR THE DWGNRA

	Zone 1 0-25 Miles (50 Mile Round Trip)	Zone 2 25-50 Miles (100 Mile Round Trip)	Zone 3 50-75 Miles (150 Mile Round Trip)	Zone 4 75-100 Miles (200 Mile Round Trip)	Zone 5 100 + (250 Mile Round Trip)
1) Population (1000)	645	4,516	15,803	3,575	10,637
2) Probability of 1 Visit	1.5	0.3	0.6	0.02	0.01
3) No. of Visits (000)	986	1,354	948	72	106
4) Vehicle Cost \$ (per capita)	.78	1.56	2.34	3.12	3.90
5) Time Cost \$ (per capita)	1	2	3	4	5
6) Total Trip Cost \$ (per capita)	1.78	3.56	5.34	7.12	8.90

Eventually, visitor surveys should be taken at DWGNRA to determine the probability that a household within a zone visits the area within a year. The method of conducting such surveys are discussed in Section 3 of this chapter. Since these data are unavailable, the visit rates shown in line 2 of Table 1 were assumed; but they are reasonable assumptions since they are based upon behavior at other national parks.³

The third line in Table 1 shows the total number of visits from each zone (line 1 multiplied by line 2). The total number of visits from all zones is 3,466,000, a figure within the 1 to 4 million envisioned by Concklin and Roussant (1975).

The fourth line in Table 1 shows the round-trip cost of a visit from each of these zones. Since almost all visitors arrive by automobile, the cost was assumed to be \$.0548 per vehicle miles.⁴ The cost was divided by 3.5 to account for the average number of passengers per vehicle. Ideally, the costs should also include the costs of meals and lodging incurred during the trip, properly measured as the difference in the costs of providing these services at home and their cost on the road.

The cost of the time used to drive from home to the recreation site is also an important cost, but it is difficult to measure. Ideally, one would need to know the *net* cost of time--the difference between the full cost of time and the value of the enjoyment of the trip itself. Very little research has been done in this area, and results are conflicting. Burton and Fulcher report on several studies in Europe and America that indicate that a significant amount of driving is done for pleasure alone.⁵ Norton, on the other hand, surveyed coach visitors

³One of the most detailed studies in which visit rates are published is that of William B. Beyers, *An Economic Impact Study of Mt. Rainier and Olympic National Parks*, prepared for the National Park Service, 1970. Since DWGNRA is smaller than Olympia Peninsula National Park, visit rates have been reduced.

⁴See *Cost of Operating an Automobile*, U.S. Department of Transportation, April 1972, Table I.

⁵T. L. Burton and M. W. Fulcher, "Measurement of Recreation Benefits - A Survey," *Journal of Economic Studies*, Vol. 3, No. 2, July 1968, pp. 35-48.

in Snowdonia, Wales, and found that the trip itself was of relatively low value.⁶ In one attempt to overcome this problem, Mansfield asked survey respondents to place a value on the travel time necessary to reach their recreation destination.⁷ Common has argued persuasively that the value of time can be measured endogenously by observing different behavior patterns as both distance and time vary.⁸ Common's tentative findings were that there were no net time-costs from recreational travel because the value of the trip outweighed the cost of the travel time.

Since no data are available, the arbitrary technique of assigning \$1 per capita for each zone travelled through is used (line 5, Table 1). This allows for the high fraction of children (with an implicitly low value of time) and also for some positive enjoyment from the trip. A positive time cost will most probably still be experienced by most visitors because of the traffic congestion on hot summer weekends when most trips are made.

Line 6 shows the total per capita trip cost from each zone. This information can be used to estimate the relationship between hypothetical admission charges and the number of visits shown in Table 2. For example, at no admission charge there will be 3,466,000 visitors. If there is a charge of \$1.78 cents per capita, then those visitors in Zone 1 will face a cost of access similar to that faced by visitors from Zone 2 before the imposition of an entrance fee. The probability of a household making one visit will fall from 1.5 to 0.3 if the population in both zones responds to the same type of economic incentives. Instead of 986,000 visits from Zone 1, there will only be 193,000. Similarly, the probability of a visit from Zone 1 will fall

⁶G. A. Norton, "Public Outdoor Recreation and Reserve Allocation: A Welfare Approach," *Land Economics*, Vol. XLVI, November 1970, pp. 414-422.

⁷N. W. Mansfield, "The Estimation of Benefit from Recreational Sites and the Provision of a New Facility," *Regional Studies*, Vol. 5, No. 2, 1971, pp. 55-69.

⁸M. S. Common, "A Note on the Use of the Clawson Method for the Evaluation of Recreational Site Benefits," *Regional Studies*, Vol. 7, No. 4, 1973, pp. 401-406.

TABLE 2. ANNUAL DEMAND FOR VISITS TO DWGNRA

<u>Admission Price</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>	<u>Zone 4</u>	<u>Zone 5</u>	<u>Total</u>
0	986	1,354	948	72	106	3,446
1.78	193	271	316	36	0	816
3.56	39	90	158	0	0	287
5.34	13	45	0	0	0	58
7.12	8	0	0	0	0	8

from 0.3 to 0.06, and the number of visitors will fall from 1,354,000 to 271,000. If the cost of a visit (travel cost plus admission charge) increases beyond that experienced by the population of Zone 5 (with no fee), it is assumed that there will be no visitors at all. Using this technique, it is possible to compute each of the entries in Table 2. The first and the last columns, admission prices and total number of visits, are coordinates of points on the demand curve. Figure 2 shows these coordinates when the admission price is measured on the vertical axis and the number of visitors measured on the horizontal axis.

As suggested above, the area beneath the demand curve measures the gross value of the benefits to the users. By constructing a smooth curve through the estimated points and measuring the area beneath, a rough estimate of this gross annual flow of benefits can be made. This is \$4.25 million, or about \$1.25 per visitor. If we assume that the demand function remains unchanged over time, and if we use a discount rate of 10 percent, then the present value of this future stream of visits is \$42.5 million, the capital sum required to generate that income stream.⁹

However, it is unlikely that the demand curve will remain stationary over time. Even though the population of the tri-state region

⁹Since the cost estimates were in 1972 dollars, this figure must be inflated to \$51.4 million to express it in current (1975) dollars.

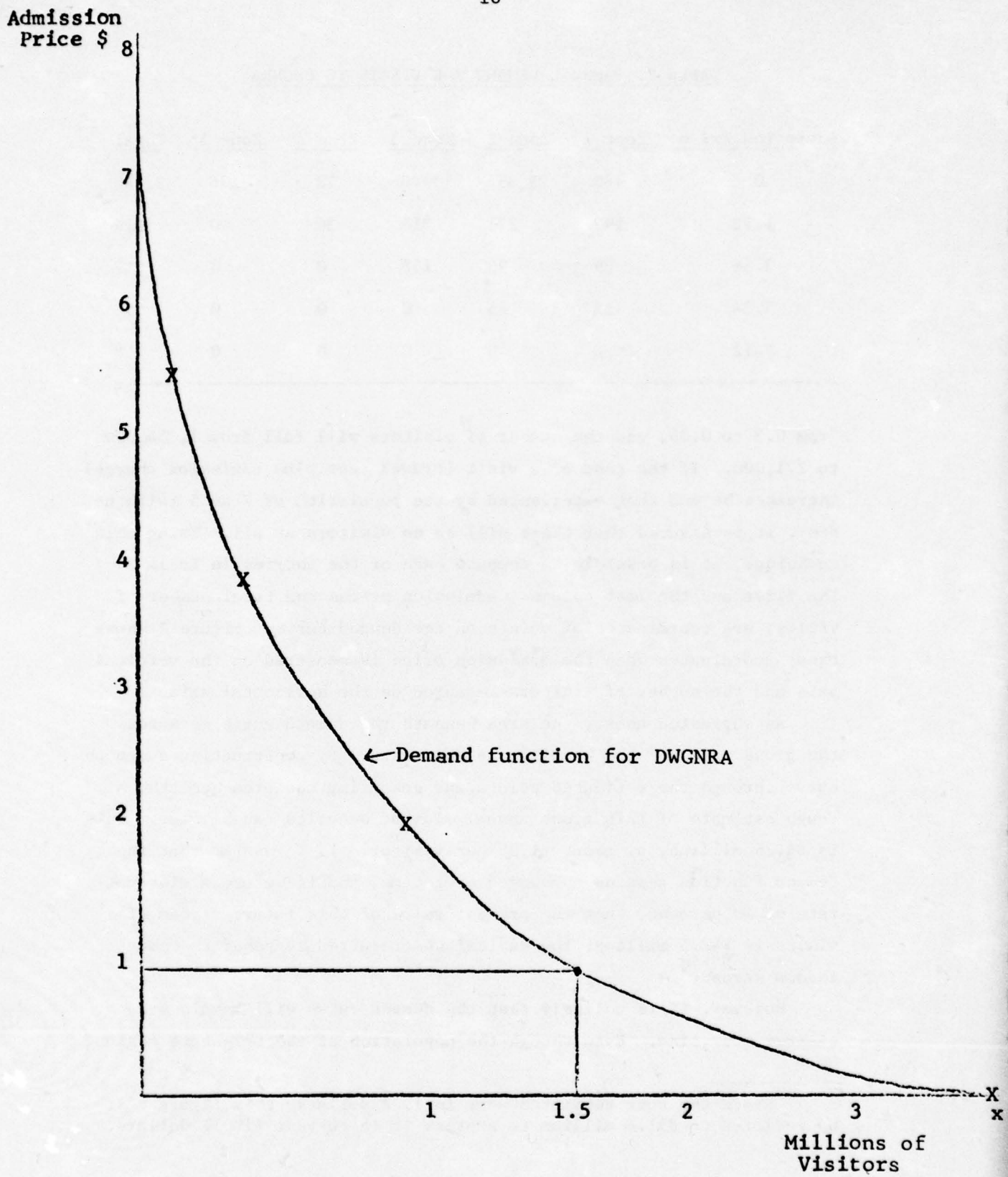


Figure 2. DEMAND FUNCTION FOR DWGNRA

is unlikely to grow at more than one-half of 1 percent per year,¹⁰ rising real income is strongly associated with a more than proportional rise in demand for recreational facilities. Boyet and Tolley estimated that a 1 percent increase in real income was associated with at least a 1.5 percent increase in demand for visits to a park.¹¹ It is reasonable to expect an average annual growth in demand of at least 5 percent. This does not mean that the annual stream of gross user benefits at DWGNRA will increase by 5 percent, because at some point capacity will be reached and the increase in visitors will be deterred either by excessive congestion in the area or by admission prices imposed to preserve the area from overuse. Calculations of the present value of the park should project capacity and the annual rate of growth of benefits. For example, if the capacity is 4 million visitor days, it will be reached after three years at an annual growth rate of 5 percent. After that the total value of benefits grows by less than 5 percent.¹² Although the data necessary to tackle this issue more fully are not available, planners should be aware that these costs should, and could, be included in an estimate of recreation benefits.

The initial figure of nearly three and one-half million visitor days will not be achieved immediately upon completion of the area. It is likely that there is a "learning function" of the local population. There will be a lag of several years as households learn of the quality and type of recreational opportunities available at DWGNRA. Public education will be achieved through media coverage. Figure 3 illustrates the type of expansion of use that might be expected. During the initial years, as people learn about the park, growth in

¹⁰Regional Plan Association, 1975.

¹¹Wayne E. Boyet and George S. Tolley, "Recreation Projection Based on Demand Analysis," *Journal of Farm Economics*, Vol. 48, November 1966, pp. 984-1001.

¹²This problem is discussed at length by John V. Krutilla, in "Evaluation of an Aspect of Environmental Quality," *Resources for the Future*, Reprint No. 93, June 1971.

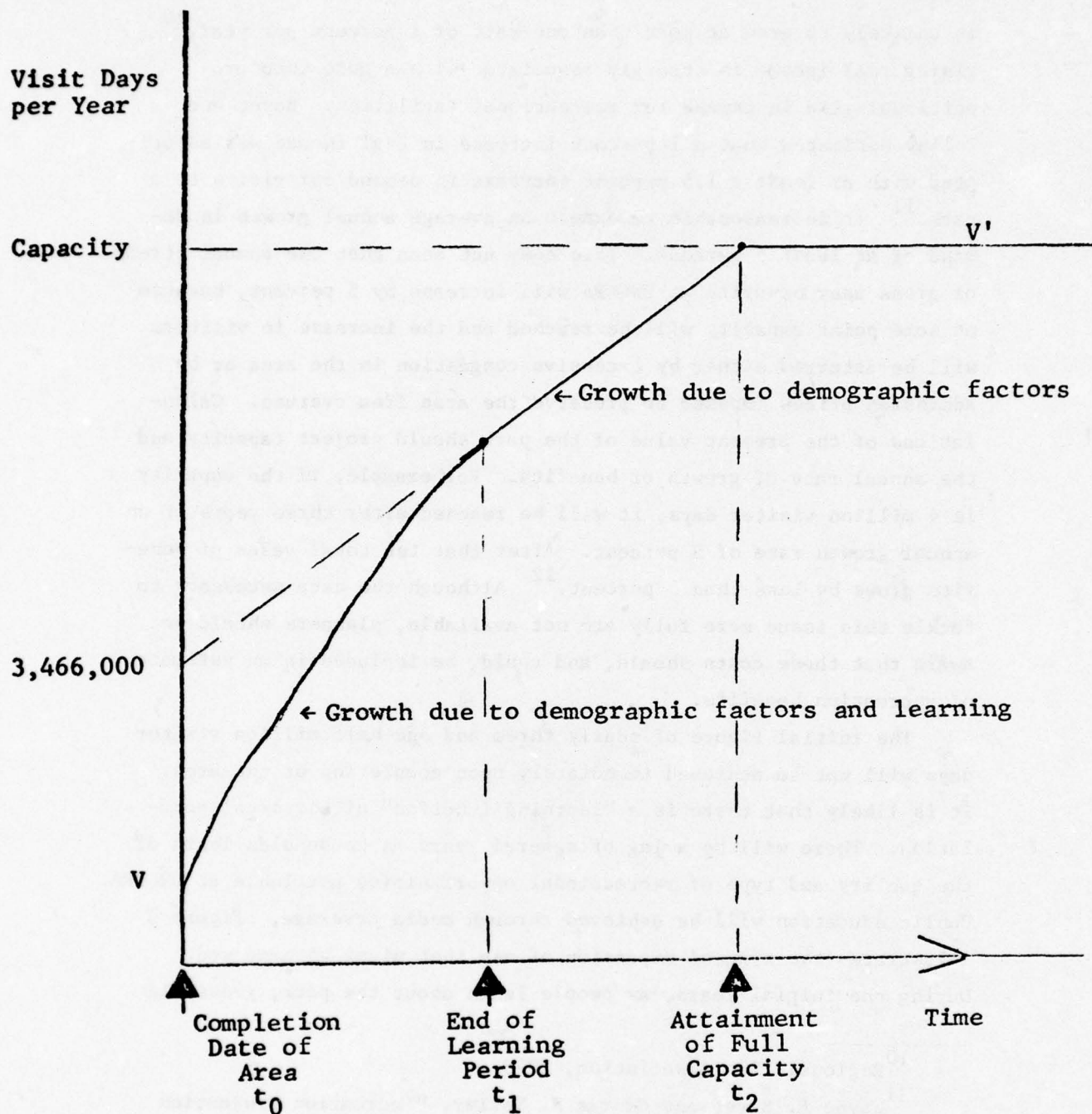


Figure 3. EXPANSION IN USE OF RECREATION FACILITY OVER TIME

use is more rapid than the growth in local population and income warrant. The line VV' measures the actual number of visitor days in each year. Between time t_0 and t_1 , use expands rapidly. Between time t_1 and t_2 , use expands as population and income grow. After t_2 , full capacity has been reached and the number of visitor days grows slowly, if at all.

The gradient of the learning curve is an important factor in determining the appropriate timing for the development of the area. If development can be delayed because "learning" will not bring excessive demands upon the system, then the expenditure can be used to meet more pressing needs elsewhere. The long experience of the NPS in developing recreational areas and the data of park use over time provides an untapped resource from which the learning curves of older parks could be estimated and those of proposed parks could be predicted. Figure 4 shows the number of visits over a ten-year period at four national parks or recreation areas expressed as an index of their level in 1970. The two areas developed relatively recently, Cape Cod and Whiskeytown, doubled their attendance in five or six years. The older areas, Yellowstone and Grand Canyon, took 10 years to double their attendance. A sample this small can only be illustrative, and many factors may help explain the different visitor growth rates. The possibility of a learning curve is, however, very real. Further research is necessary in this area in order to understand the phenomenon fully and to adjust planning decisions accordingly.

Before continuing with a discussion of other benefits of DWGNRA, an important use of an estimated demand function should be noted. When capacity is reached, the imposition of an admission price to deter excessive numbers of visitors can be an efficient solution to the problem of overcrowding, particular if there are few opportunities for expanding the capacity. If the demand curve is known, then the appropriate price to charge can be easily estimated. For example, if the desired annual visit rate were only 1.5 million and the demand schedule in Figure 1 is correctly identified, then an admission

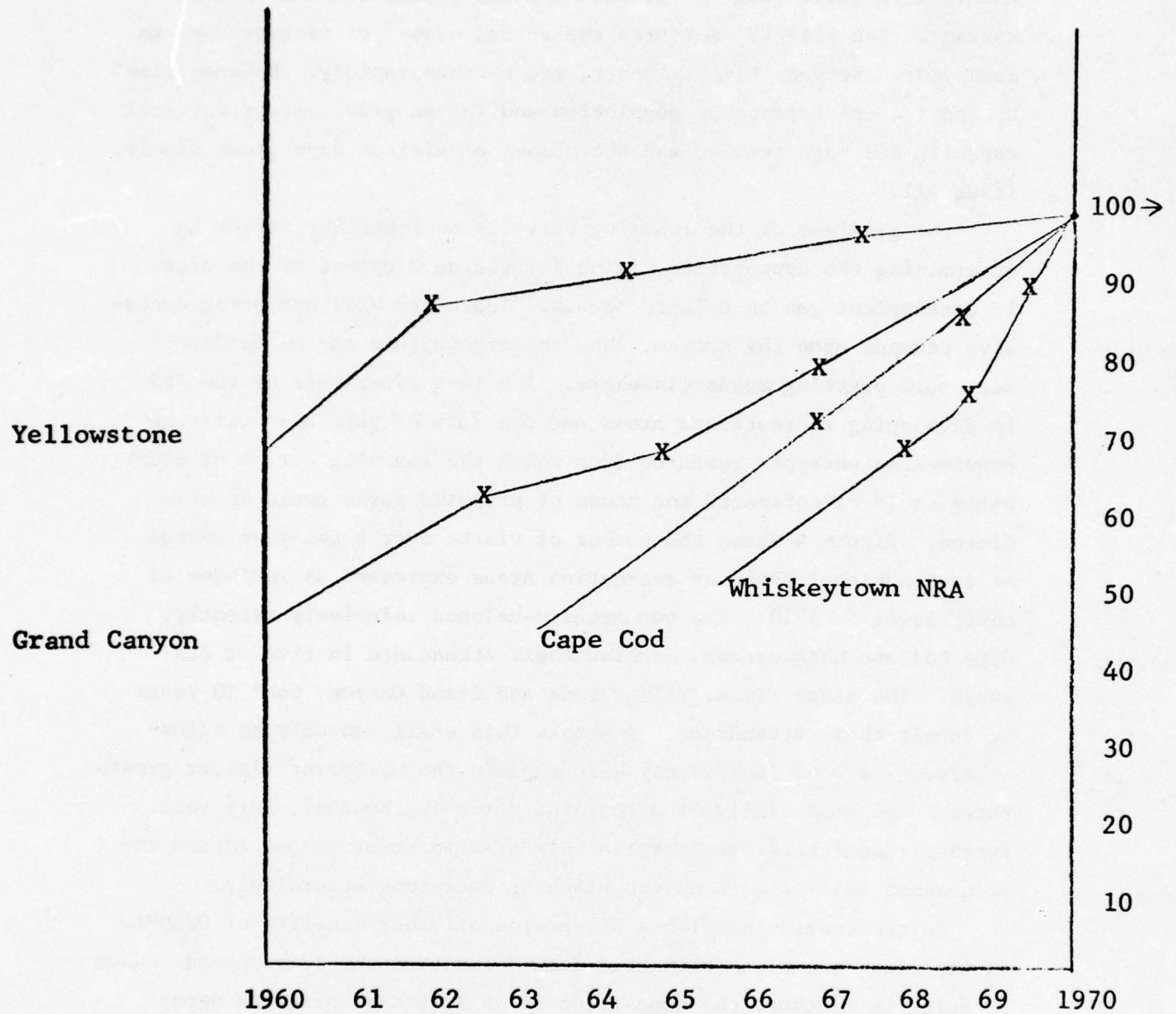


Figure 4. INDEX OF VISITS TO FOUR NATIONAL PARKS, 1970 = 100

Source: Public Use of the National Parks: A Statistical Report, 1960-72, U.S. National Park Service

charge of \$1 will limit the number of visits to the desired level.¹³

Local Benefits

In addition to the user benefits, measured by demand analysis, the development of the DWGNRA will increase the "productivity" of some of the surrounding farmland by encouraging the development of campsites and other auxiliary services. The recreation area provides a focus for campers and vacationers. The value of this increased productivity can be measured as the difference between the average value of farmland per acre away from DWGNRA and farmland sold for alternative uses adjacent to the area. For example, if 2,000 acres of farmland are developed near DWGNRA and can be sold for a premium of \$100 per acre, then there are \$20,000 of benefits from this source. Data on land transactions near a proposed recreation area should be compiled as a matter of course during the planning and development stage of any such project.

Indirect Benefits

A less measurable but very real source of benefits resulting from the development of a recreation project is the reduction in congestion costs at other recreation sites. Thus, if the development of DWGNRA reduces the vehicle and people congestion on the approach roads to and within nearby recreation areas, then this annual benefit must be added to the value of DWGNRA as a recreation site.

The economics of traffic congestion has received extensive analysis in economic literature.¹⁴ The problem arises because the user of a road does not have to pay the full social cost of his

¹³From the point of view of capacity, the total number of visits annually is less important than the demand on any sunny weekend in June, July, and August. Techniques for including this are discussed below.

¹⁴A complete bibliography would not be useful. For a recent discussion, see J. Rothenberg, "The Economics of Congestion and Pollution: An Integrated View," *American Economic Review Papers and Proceedings*, May 1970, pp. 114-121.

actions. People congestion has received less attention, although the problem is just as severe.¹⁵ Data on the level of crowdedness of highways are available.¹⁶ Similar data for congestion within recreation facilities are not available.¹⁷ The magnitude of this potential benefit may be considerable. For example, if DWGNRA diverted sufficient traffic from the highly congested Palisades Parkway to the relatively uncongested Interstate 80 on a Sunday evening, thereby reducing the travel time of those remaining on the Parkway by 10 minutes, and if there were two million travellers affected during the year (at \$3 per hour), the benefit would be equal to \$1 million per year, or nearly 25 percent of the direct user value of the park.

A survey of users of DWGNRA could establish the number of travellers who used Interstate 80 instead of Palisades Parkway, and traffic engineering data could be used to convert this into reduced travel time. Against this benefit would have to be weighed the cost of the increased congestion on I-80. The possible magnitude of this benefit makes it an important entry in planning decisions. In addition, those still using recreation facilities near the Hudson will experience less difficulty securing picnic tables and will enjoy more open space. Research is needed to measure the magnitude of this

¹⁵There are a few exceptions: The theoretical issues are discussed in F. J. Anderson and N. C. Benson, "Allocation, Congestion and the Valuation of Recreational Resources," *Land Economics*, Vol. L, No. 1, February 1974, pp. 51-56. The only substantial contribution to measuring the value that people place in space and, therefore, also the corollary, the cost of crowdedness, is the work by V. S. Hastings and George S. Tolley, "Quality of the Recreational Experience - Estimation of Its Benefits," *Army Corps of Engineers*, mimeo, 1966.

¹⁶The Tri-State Regional Planning Commission collects data for recreation traffic congestion.

¹⁷The use of aerial photography as a source of quick and efficient information on the distribution of congestion within a recreation site has not been explored. It is discussed at greater lengths below.

indirect benefit. The techniques have been developed and used by Hastings and Tolley (op. cit.).

Other indirect benefits prove less easy to measure. The possibility of reduced crime and improved mental health that increased recreation participation may lead to has already been mentioned. There is also the value of DWGNRA to non-users who value the knowledge that the opportunity to enjoy it is there, even if it is never exercised.¹⁸

These three classes of benefits, taken together, constitute the gross value of DWGNRA as a recreation site. They must be compared with the costs in order to determine the net value of the area to society.

Planning and Development Costs

The development of a recreation area involves major capital expenditure and considerable resource reallocation. In order to determine whether such an effort is worthwhile, a comparison of these costs with the potential benefits is valuable. A major component of these costs is the land. The cost of the land is its value in its "next best" use. For DWGNRA, the terrain is too uneven to make it valuable for agriculture, but it has considerable potential as a site for residential development. This value should be reflected in the price at which the government purchased the land. However, market price may occasionally diverge from true value. The federal power of eminent domain allows the government to purchase land below the true value, especially if local landowners are few in number and relatively disorganized. On the other hand, a small group of well-informed landowners can artificially inflate the market price of land. When attempting to evaluate land, as part of the planning stage, care should be taken to gather as much information on local land values as possible to avoid the possible distortions that can arise if a small sample is used.

¹⁸This concept was named 'option demand' by B. Weisbrod in "Collective Consumption Services of Industrial Consumption Goods, *Quarterly Journal of Economics*, Vol. LXXVIII, August 1964, pp. 471-477.

The cost of planning and development should be estimated by examining past experience at other areas together with data on the change in construction and development costs. Again, the extensiveness of the National Park Service's experience in recreation development provides a great deal of data on which estimates for proposed areas might be based.

Costs that are to be incurred in the future should be discounted to the present. It is important that a cost-benefit analysis should be performed at one point in time, with both future costs and benefits discounted to that time. Failure to do this can lead to inaccurate, or even perverse, estimates.

It is not necessary to regard the area as one project which is either worthwhile or not. Where development can be broken down into operationally separate components--the construction of a visitor's center, the expansion of an access road, etc.--these may be thought of as separate projects, and separate "marginal" cost-benefit estimates made for each. This is discussed more fully in Chapter 3 below.

Operating and Maintenance Costs

Unfortunately, operating and maintenance expenses are rarely determined by criteria of efficiency. The park budget is allocated toward certain predetermined development areas, with the remainder to be spent on maintenance. This is particularly true at the national level where the pressing demands for an expanded park system have left national parks dramatically undermaintained. The consequences of this resource misallocation are not fully realized immediately, but over time the impacts will become more and more apparent. Visitor services will decline; intensively used areas will suffer from vegetation damage, soil erosion and poor drainage; rest stations will break down and become vandalized; in some of the monument areas, irreparable damage will be experienced. Maintenance of a park is as necessary as maintenance of a home; in fact, some would argue more so. While housing can be replaced, many of the nation's parks cannot. Commitment to build a park must be matched by commitment to maintain it as a viable recreation resource.

An important part of the planning stage should be an attempt to predict maintenance requirements for the future. The cost of maintaining a recreation site depends upon a number of factors:

- (a) The size of the site, the type of vegetation and animal life, and its surface geography;
- (b) The intensity of use by recreationists;
- (c) The type of recreational use that it receives; and
- (d) The quality level at which it is to be maintained.

Again, by analyzing past experience and by predicting future use, informed estimates of future maintenance costs can be generated. And again it is necessary for the NPS to collect information from its many areas in a systematic way to provide the basic data on which such analyses could be based.

Indirect Costs

As with indirect benefits, many of the indirect costs--those costs borne by non-users of the park--are difficult although not impossible to quantify. For example, the noise and traffic congestion that residents living along the principal access roads will suffer are a real cost of the project. While it may appear difficult to measure such costs, some indication of their respective magnitudes can be gauged from the behavior of residential property values. A study of property values in the city of Chicago showed that an increase in an index of the ambient noise level from 50 dBA to 55 dBA lowered the value of a \$20,000 home by \$661.¹⁹ The relationship between traffic flow and noise level is fairly well understood. From information on the number and initial value of dwellings along approach roads, an approximation of these damages would be possible.

Similarly, the commercial development that is likely to result from the development of the area will impose costs upon some

¹⁹ Roger J. Vaughan and L. Huckins, *Noise Pollution*, Center for Urban Studies, University of Chicago, 1975.

homeowners. Instead of overlooking meadows, houses may overlook a busy shopping center. Again, the market value of the home may reflect this visual deterioration.

There are less tangible costs as well. A family that has lived in the area for many years may have to sell and move when their plot is rezoned. Although they may receive some compensation for the uprooting, in terms of higher property values, they may not have a high enough income to enable them to buy another piece of property in the neighborhood. The institutional framework through which redress might be made is weak. A fresh look at the whole system of property value compensation is needed if these costs are to be minimized. The courts have allowed up to a 30 percent fall in property values due to rezoning to go uncompensated.²⁰ Some, if not most, of these costs do not enter the calculations from society's viewpoint. They are transfers between groups within society rather than a decrease in the value of society's resources as a whole.

The basis of any estimate of the indirect costs must come from experience elsewhere. A detailed analysis of patterns of development and property price changes that have accompanied recreation development in the past can provide a useful insight for the future. The data are available from a number of secondary sources which are discussed below.

SUMMARY

The net value of a recreation area from the point of view of society as a whole has a number of components. These should all be discussed during the preparation of a development plan. While it is impractical and probably inefficient to consider making detailed and accurate measurements of all the components, a "rule-of-thumb" can

²⁰Melville McMillan, "Open Space Preservation in Developing Areas: An Alternative Policy," *Land Economics*, Vol. L., No. 4, November 1974.

be developed that allows reasonable values to be placed on many of the components.

Comparison of Cost with Benefits

It was argued above that a cost-benefit study should be performed at one point in time. To illustrate how this is done, the present value of the costs and benefits of a recreation project is outlined schematically below.

BENEFITS

$$\begin{aligned}\bar{B}_t = & U_t + \frac{U_{t+1}}{(1+r)} + \frac{U_{t+2}}{(1+r)^2} + \dots + \frac{U_{t+n}}{(1+r)^n} + \Delta L_t + \\ & + I_t + \frac{I_{t+1}}{(1+r)} + \frac{I_{t+2}}{(1+r)^2} + \dots + \frac{I_{t+n}}{(1+r)^n}\end{aligned}$$

In this equation,

\bar{B} is the gross present value of all benefits;

U_t is the value to users of the area in year t (the area under the annual demand function);

I_t is the value of the indirect benefits in year t ;

ΔL_t is the increased value of nearby land where price increase is attributable to project; and

r is the rate of time discount.

COSTS

$$\begin{aligned}\bar{C}_t = & K_t + \frac{K_{t+1}}{(1+r)} + \frac{K_{t+2}}{(1+r)^2} + \dots + \frac{K_{t+R}}{(1+r)^R} + M_t + \frac{M_{t+1}}{(1+r)} + \dots \\ & + N_t + \frac{N_{t+1}}{(1+r)} + \frac{N_{t+2}}{(1+r)^2} + \dots + \frac{N_{t+n}}{(1+r)^n}\end{aligned}$$

In this equation,

\bar{C}_t is the gross present value of all costs;
 K_t are the planning and development costs incurred in year t ;
 M_t are maintenance and operating costs in year t ; and
 N_t are the indirect costs incurred in year t .

From the point of view of society, the project is worth undertaking if the present value of the benefits exceeds the present value of the costs. From the point of view of individual groups, this criterion cannot be simply applied. This problem is discussed more fully in the following section.

REGIONAL AND LOCAL COSTS AND BENEFITS OF THE DWGNRA

Individuals receive the benefits from, or pay the costs of, the DWGNRA according to their "membership" in certain geographic, economic, or demographic groups. For example, a resident in a local municipality (county or even state) must pay taxes to meet the cost of providing for the necessary support services--hospitals or emergency care facilities, wider roads, and fire protection services. A small store owner in an adjacent township will probably experience an increase in sales. Home-owners nearby may experience a rapid increase in the value of their homes, to such an extent that they may be forced to move. Whether the capital gain compensates for the dislocation depends upon the household's attachment to the area. If the planning and development process is to proceed smoothly, then care must be taken to explore the impact upon these groups and policies must be devised to ensure that the goal of equity is met wherever possible.

The costs and benefits for the local or regional population contain the same basic components as the costs and benefits for society as a whole, except there are some additional considerations. Many of the indirect benefits and costs and all of the local impacts are borne by those living near the park. Thus, although from the nation's viewpoint the park is a worthwhile investment, from the local viewpoint it may not be. The problem of equity is more likely to arise between different groups *within* the region rather than between the region as a

whole and the nation. This is because of two facts. The majority of the cost is met from federal income tax payments, and the majority of the users will be from the local area. In the case of DWGNRA, probably more than 50 percent of the users will have to make a round trip of less than 150 miles.

Within the region, however, there will be excessive costs and benefits borne by individual households and economic groups. Local merchants and outdoor enthusiasts will gain while the aged, the poor, and those living along access roads will lose disproportionately. The nature of this gain and loss has been discussed in the previous part of this chapter. The method of redress has also been briefly outlined.

Since individuals will lose or gain according to either the location of their home or business, the local property tax provides an excellent system of redress. Local municipal expenses are bound to increase as the local services necessary to meet the demands of park visitors are financed. Roads will have to be widened, sewage and water link-ups extended, hospitals expanded, and the local fire service improved. An across-the-board increase in property taxes ignores the differential distribution of benefits. Instead, those whose property has been harmed should have their taxes reduced, and those whose property improved should have their taxes increased. Although taxes are supposed to be tied to property values, most empirical studies have found that the link is tenuous, especially when there are rapid changes, such as those induced by the development of a park. Special planning provision should be made to conduct a detailed survey of property values so that local property owners could be taxed fairly to meet municipal needs.

Additional care should be taken for low-income families who suddenly face rising property taxes. Although such homeowners gain in the value of their property should they choose to sell, this may not fully compensate for the costs of moving elsewhere. Provision should be made to increase the property taxes on the properties of low-income (especially aged) homeowners slowly over time, to minimize dislocation costs.

The planning capabilities of local governments are stretched beyond capacity by the development of a park. Extensive rezoning must be accomplished, and municipal services expanded. If these tasks are to be accomplished smoothly and efficiently, then assistance from the NPS will be necessary. Changes in the level of local population, the employment level, and the economic structure that are likely to follow from the opening of the park should be measured. These could be calculated by comparing the experience of municipalities and counties surrounding similar parks elsewhere. The surveys reported annually as *County Business Patterns* provide data on employment by type of industry.²¹ These figures can be functionally related to the number of visits, and a prediction of employment changes based upon the predicted visitor demand can be made. Similarly, the *County and City Fact Book* provides detailed socioeconomic data at the county level. The *Census of Governments* provides detailed information on receipts and expenditures for all county, state, and municipal governments. If this data were centrally available, then analyses could be performed for any proposed recreation site. The form that such a data bank might take is discussed in the final section of this chapter.

THE TIMING OF PROJECT DEVELOPMENT

A park does not spring up fully developed overnight. It is the result of many years of expensive planning and development. It has already been suggested that there is a learning curve for park use. If development expands capacity much more rapidly than demand expands, then there is waste. For example, if \$10 million of construction could have been delayed by one year, then \$1 million worth of interest on the loan could have been saved. The first step to timing a project efficiently is, therefore, to forecast the demand function for the project into the future so that the appropriate expansion of capacity

²¹Including wholesale, retail, and personal services which are the sectors most likely to expand as a result of parks.

can be achieved. As was suggested above, this can only be done through a careful analysis of the experience over time at existing national parks.

Basically, then, the costs of delaying part of a project by one year is the value that it would have had to potential users during that year. The benefits are the interest-saved costs of the development. There are, however, some additional considerations.

First, the speed which the local governments can expand local roads and other services and can rezone to allow the private sector to provide hotels, restaurants, etc., may provide additional constraints. A developed park may provide a pleasant recreation experience during daylight, but if there are no readily available restaurants or hotels to which the tired holidaymakers can repair afterward, then the experience loses some of its enjoyment.

Another important consideration for timing development is the capacity of the local construction sector. If there is a high level of local unemployment, then the social cost of construction is lowered. The cost of hiring labor must be offset against the saving of unemployment compensation payments. In economic downturns, it is probably beneficial to speed up the construction and development of recreation sites. The record of the federal government in using public projects as a countercyclical tool has not been good. If federal agencies drew up for their projects a number of plans in which different time durations were considered, then federal funds injected into a sluggish economy could be absorbed more readily.

The major constraint upon the timing of a park is usually not the problem of evaluating the costs and benefits of alternative strategies; rather, it is the fact that the budget is determined by the federal government and cannot easily be changed at the local level. Budget inflexibility prevents a project from being speeded up even when demand increases merit it. Planners and managers should be aware of the possibility of mobilizing private funds for this purpose. Institutional arrangements within the National Park Service should be changed to permit increased use of leases and concessions so that private capital can augment public funds. This area is discussed more fully in Chapter 3 below.

Lastly, it should be added that a moderate pace of development has certain advantages. A master plan is drawn up based upon anticipated visitor behavior. Actual behavior may deviate. A particular spot may have charms to visitors that escaped the planner's eye. By sampling visitor behavior during development, managers can modify plans in order to accommodate visitor behavior.

DATA NEEDS AND AVAILABILITY

A number of points emerge from the preceding discussions concerning the form in which costs and benefits should be estimated. Of primary importance, for almost all of the decisions that must be taken, is a detailed understanding of the demand function for the area--both the present demand and its response to future demographic and economic changes and to changes in the availability of recreation services at the site.

The simple analysis described in the first section of this chapter describes the conceptual framework within which demand analysis can be performed. However, a number of simplifying assumptions were made that should be relaxed if a detailed and accurate analysis is to be made. Two important assumptions were, first, that the populations in each of the zones were similar in their preferences for outdoor recreation experiences and, second, that all visits were similar so that the aggregate demand for visits was a meaningful concept for analysis. In order to understand the type of data necessary for a full analysis, the impact of relaxing these two assumptions must be discussed.

Preferences for Outdoor Recreation

People differ in their taste for outdoor recreation opportunities; and tastes change over time. One year a household may visit a nearby park frequently, the next year--due perhaps to illness in the family, a European vacation, or pressure of work--the frequency may drop dramatically. The larger the population, the more likely it is that these stochastic influences on visits will cancel out. However, the differences in visit rates that are due to differences in the socioeconomic qualities of the population will not cancel out, and they are

important to understand and, if possible, to include in the analysis. There are some measurable attributes that can be related to visit rate. If these relationships are measured, then it is possible to achieve a much greater degree of precision in estimating the aggregate demand function and also in understanding the way it is likely to change over time. The number of factors that might be relevant in determining a group's likelihood of visiting a recreation site is potentially infinite--from parental influence to the size of the backyard. However, to obtain meaningful statistical results and to reduce the cost of analysis to more reasonable proportions, planners must exercise prior judgment to limit this list. Table 3 provides a tentative list of socioeconomic variables that are likely to affect the probability of a household visiting a site above and beyond the cost of the visit discussed in Section 1.

TABLE 3. FACTORS LIKELY TO AFFECT RECREATION BEHAVIOR

<u>FACTOR</u>	<u>PROBABLE DIRECTION OF EFFECT ON VISITS</u>
Income	+
Age	+ (0-25); - (40+)
Urbanization	+
Education	+
Number of Children	+
Auto Ownership Rate	+

Income is probably the most important factor. Several studies have included information on visitors' income and have uncovered a strong positive relationship between income and visit rate.²² However,

²²For example, see Boyet and Tolley, op. cit., C. Cicchetti, J. Seneca and P. Davidson, *The Demand and Supply of Outdoor Recreation*, BOR, 1969, ORRRC Report No. 22, and *Outdoor Recreation, A Legacy for America*, BOR, 1973.

a certain amount of care is necessary in interpreting these results. Lindsay and Ogle,²³ examining recreation behavior near a small Utah community, found no appreciable difference in visit rate between income groups. They hypothesized that, in many urban areas, the higher-income groups may face a lower "access price" to recreational opportunities and that this should not be confused with a pure income effect. Price differences cause a movement *along* the demand curve, while income differences cause a shift in the entire demand curve. This illustrates the importance of correctly specifying the functional form of the estimating equation if meaningful and reliable estimates are to be achieved. The direction of the income effect on the demand for a local recreation area may not be positive (i.e., an increase in income increases the probability of a visit) for all ranges of income. Between \$5,000 and \$15,000 of annual income, it is likely that increases in income are associated with an increased visit rate. However, as incomes rise beyond the middle-income level, households may substitute from relatively inexpensive visits to local areas to more expensive recreation experiences--a European vacation or a week in the Bahamas, for example. Table 7 in Chapter 4 shows that, for several recreation activities, the participation rate of higher-income families is lower than for middle-income families.²⁴

Age is likely to be another important factor in determining the number of visits a household will make. Again, the relationship is unlikely to be a simple monotonic one.

The degree of urbanization of the surrounding population may affect its desire to visit a recreation area.²⁵ With much less access to local open space, either in the form of backyards or parks, city dwellers may rely on large national recreation areas for more of their

²³J. L. Lindsay and R. A. Ogle, "Socioeconomic Patterns of Outdoor Recreation Use Near Urban Areas," *Journal of Leisure Research*, Vol. 4, No. 4, 1972, pp. 19-24.

²⁴Participation rate defined as the percent of recreationists of a given activity from an income group relative to the percent of the total population of that group.

²⁵Boyett and Tolley (op. cit.) found no significant impact, although the aggregate nature of their analysis may explain this.

recreation needs than do suburban or rural families. At the same time, they may have less of a taste for outdoor recreation than their rural cousins. If there is an element of learning by doing in recreation, then the absence of urban open space will have a marked affect upon tastes.

Education, too, may affect recreation demand. A high educational attainment may facilitate the process of learning about available recreational opportunities. It also may help the family gain the maximum benefit from a visit to a recreation site. Education tends to be highly correlated with income and, therefore, care is needed to properly separate and identify the effects of education and income.

The size of a family may affect the desire for open space recreation and, therefore, the average family size (or the number of families with five or more members) in local communities will affect a site's visit rate.

Similarly, the rate of automobile ownership will probably be important in determining the number of visitors.²⁶

Data for all these and other variables are available. Information on state, county, municipality, and even census tract levels can be obtained from the decennial census; and annual update estimates are available in state statistical yearbooks.

These data can be used to estimate a more accurate demand function for park visits by estimating separate demand functions for each socioeconomic group, in exactly the same way as the aggregate demand function was estimated in Section 1 of this chapter, and then adding these separate functions horizontally. For example, the demand function for households with incomes in excess of \$25,000 per year would be estimated in a number of stages.

- (a) From the sample, and using the total number of visits, an estimate of the total number of visits

²⁶This will depend, of course, upon the availability of other forms of transportation.

by members of this income group from each distance zone would be estimated.

- (b) From census information the total number of households in each distance zone within this income category could be estimated.
- (c) The visit rate as a function of distance could then be estimated for each zone.
- (d) The cost of a visit from each zone of this income group could be estimated.²⁷
- (e) From these data, the demand function could be estimated.

The way in which these separate demand functions are aggregated is shown in Figure 5. The demand function for one income group is $D_b D_b'$ and that of another is $D_a D_a'$. The total demand by both groups is obtained by horizontally summing these two demand functions to give $D_b E D'$.

The number of meaningful disaggregations that can be made depends upon the size of the visitor information sample survey, which, in turn, is limited by the financial resources made available for this purpose.

These separate demand functions, and the calculations necessary to derive them, would provide a valuable insight into the way in which visitor behavior changes over time. It would be possible to calculate a number of visit rates for different socioeconomic classes at similar distances. A rough approximation of changes in behavior (visit rates) in response to changes in income can be obtained by estimating the relationship between percent changes in income and percent changes in visit rates across and within zones. The "income effect" can, therefore, be separated from the price effect. Ultimately, as visitor sample surveys are established on a regular basis, time series data

²⁷Travel costs differ across income groups because of the differences in the cost of time. These costs could either be approximated, as in Section 1 above, or determined endogenously as suggested by Common (op. cit.)..

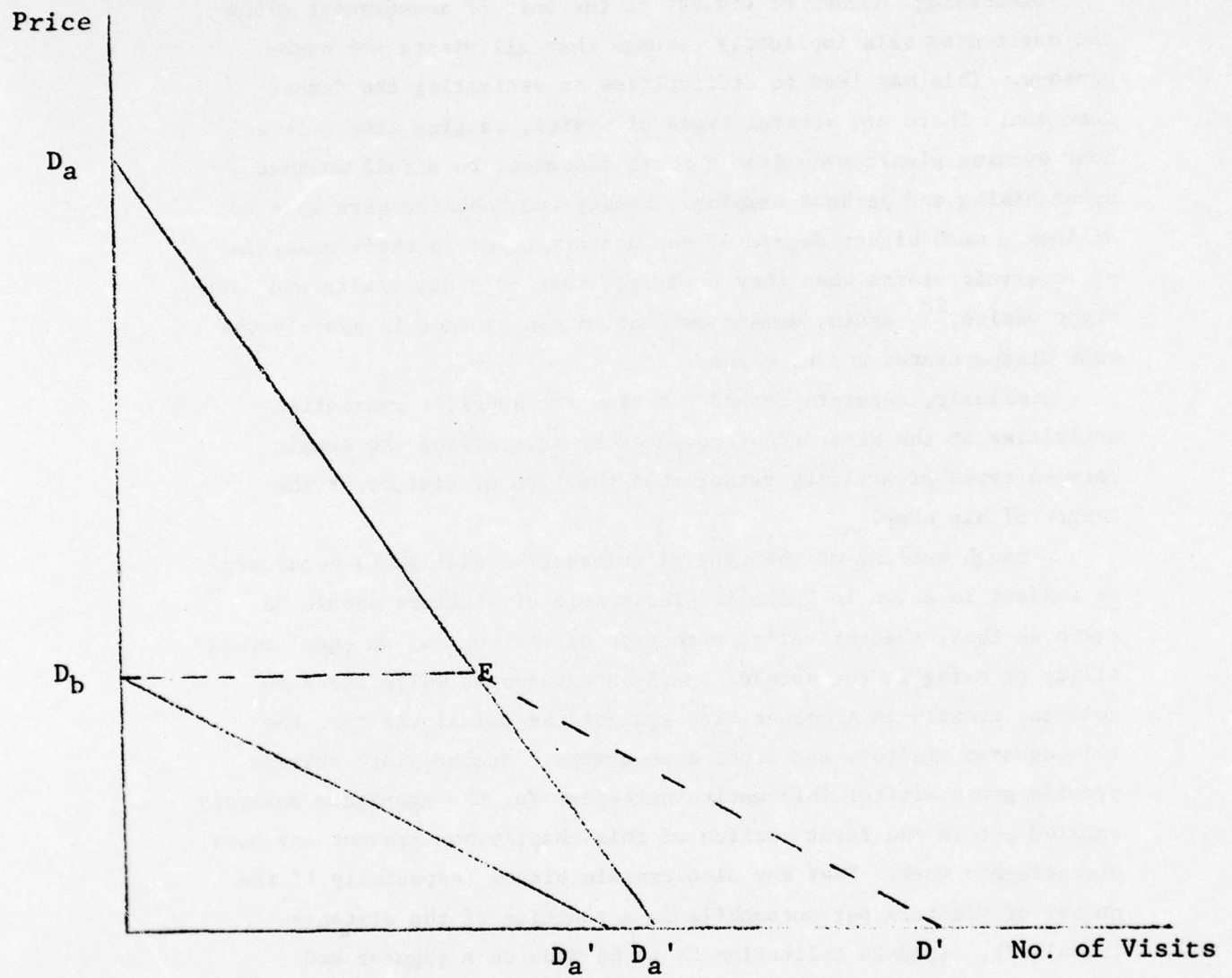


Figure 5. AGGREGATION OF GROUP DEMAND FUNCTIONS

should become available with which to test the validity of this cross-sectional approach.

Types of Visits

Discussing "number of visits" as the unit of measurement along the horizontal axis implicitly assumes that all visits are homogeneous. This may lead to difficulties in estimating the demand function. There are several types of visits, ranging from a three-hour evening picnic made from a short distance, to a full weekend spent hiking and perhaps camping. Pankey and Johnston were able to achieve a much higher degree of explanatory power in their analysis of reservoir visits when they separated them into day visits and overnight visits.²⁸ Again, demand estimation can proceed in exactly the same disaggregated way as before.

Similarly, separate demand function for specific recreation activities at the site can be computed by stratifying the sample between types of activity rather than the type of visitor or the length of his stay.

A rough outline of the type of information that it is necessary to collect is shown in Table 4. The sample of visitors should be taken so that, theoretically, each type of visitor has an equal probability of being in the sample. Mail-back surveys, while cheap to collect, contain an inherent bias against the casual visitor, the ill-educated visitor, and other such groups. Number plate surveys²⁹ provide gross visitor information necessary for the aggregate analysis carried out in the first section of this chapter but prevent any more disaggregate work. They may also contain biases (especially if the number of visitors per automobile is a function of the distance travelled). If data collection is to be done on a regular and

²⁸V. S. Pankey and W. E. Johnston, *Analysis of Recreational Use of Selected Reservoirs in California*, Contract Report No. 1, U.S. Army Engineer District, Sacramento, May 1969.

²⁹A sample of number plates of vehicles in parking lots is taken and the addresses of the visitors obtained through the respective states' vehicle licensing centers.

TABLE 4DATA REQUIRED TO ESTIMATE DISAGGREGATED DEMAND FUNCTIONS

- (1) Total number of visitors (peak and off-peak) for a scientifically selected sample of visitors.
 - (2) Point of origin: (address or zip code), mode of transportation.
 - (3) Socioeconomic characteristics: income, household size (number of children), education, age, etc.
 - (4) Nature of trip: returning same day, overnight stay, longer.
 - (5) Activities participated in during stay and allocation of time for each.
-

standardized basis, then it would be valuable to conduct a series of tests at selected sites over a considerable period of time in order to determine the costs and the relative efficiency of alternative sample procedures.

The basic data shortage is not of information about the surrounding population but about park users themselves.

Data from a single site cannot provide all the information necessary for determining visit demand shifters and public needs for recreation services. Visitor surveys, in a standardized format and based upon a standardized sampling technique, should be taken at all national park, forest and recreation areas, together with the basic socioeconomic characteristics of their local populations. With this information, differences in the visit rates of particular population groups within certain distance zones can be related to attributes of the visit areas. The learning curves discussed above can be identified and capacity constraints can be effectively analyzed. The impact of park size, the area of water, the mix of facilities, the level of visitors' services, maintenance, attractiveness, and other decision variables can be understood in much greater detail.

Capacity

Capacity, or the impact of congestion, is very poorly understood. Standards for many types of recreation facilities--people per acre of beach, picnic area or hiking trail--have been set, based upon little more than the informed guesswork of planners. By observing actual use and rates of change in actual use over time and between income groups, a much better feel for the capacity can be obtained. Total visits should be computed for the year and then for the 20 or 30 days in which the park is most heavily used. For most northern parks those days will correspond to June, July, August, and September weekends (but that is certainly not universally true).

Separate demand estimates for areas and specific facilities during these days are imperative for three reasons. First, it is to meet this peak demand that any additional capacity would be constructed. Second, if alternative rationing policies are to be tried,³⁰ this demand function would provide information on the appropriate rationing price to restrict visitor use. And third, congestion costs must be estimated in order to perform any type of cost-benefit analysis.

Vital to a proper understanding of congestion is a feel for the distribution of people within a park during peak days. Aerial infrared photography can provide a relatively cheap and effective way of observing people distribution and of identifying facility bottlenecks. The logistic "people distribution" within recreational open space has not achieved the attention that it deserves. Rather than develop a park along a rigid master plan, it may be much more efficient to introduce modification according to the way the park area is actually used. The costs to a family laden with picnic equipment of finding a less crowded beach in a park can be very high. Unless all areas are clearly visible, the level of crowding may not be efficiently distributed between different sites. By studying aerial photographs, planners can identify such potential bottlenecks and take steps to ensure a smoother distribution of users.

³⁰ For example, differential pricing systems, limited admission hours, or some similar policy with the goal of restricting the number of visitors.

An effective cross-sectional analysis between recreation areas requires that certain data be collected for each area and be available to complement the visitor-sample surveys. Table 5 shows the type of data that could be made available on a park-by-park basis at relatively little cost.

TABLE 5

ADMINISTRATIVE DATA TO BE ASSEMBLED FOR EACH PARK ANNUALLY

- (1) Operating expenses: maintenance and repair, labor equipment, materials.
- (2) Revenue collected: entrance fees, concession fees, fees from specific activities.
- (3) Capital expenses: planning and development, new construction, etc.
- (4) Accidents and injuries to vacationers: traffic accidents, other.
- (5) Crime and vandalism: protection services expenses, number of incidents, costs.
- (6) Fire: number of incidents, cost of extinguishing services, cost of damage.
- (7) Transportation: distribution of visitors by mode, costs of transportation services *within* park, costs of transportation services *to* park.
- (8) Estimate of facility wear and tear damage.
- (9) Physical attributes of the area: size, range of facilities, etc.

In addition to these data, information about the socioeconomic base of the surrounding communities should be assembled. The most suitable unit is probably the county, since employment, population, and local government data are available at this level. Table 6 shows the data that should be assembled, annually, for counties.

The purpose of these various data banks and their combination would be to generate a compatible file, consistent between parks and over time, that showed a profile of a park itself, its visitors, and the socioeconomic matrix in which it was located. From a rich base

TABLE 6. COUNTY DATA TO BE ASSEMBLED AROUND EACH PARK

(1) Distance of county median to park.	
(2) Population level and distribution by selected socioeconomic factors.	Decennial Census
(3) Local government expenditures in major public service areas (health, education, recreation, police, fire, etc.), tax revenues, and inter-governmental, etc.	Census of Governments (every 5 years)
(4) Employment levels, by 3 digit SIC* number, of establishments for manufacturing, wholesale and retail, and selected services	County Business Patterns (annual); Census of Manufacturers, wholesale, retail, and selected services (every 5 years)

* Standard Industrial Classification

such as this, planning decisions for new parks in new areas and for the expansion of existing parks could be made, based upon well understood criteria. Administratively, the National Park Service budget allocations could be based much more closely upon need. The data base would go a long way in dispelling the deficiencies described in *Outdoor Recreation, A Legacy for America*, by the Bureau of Outdoor Recreation.

Neither would the cost of data collection be prohibitively high. The National Park Service facility at Mississippi has access to excellent computer facilities. There would be some initial fixed costs as the collections program was set up and the data were initially assembled. After that, the costs of updating the file would be relatively low. The data from the various federal censuses is available on computer tape; thus, the cost of updating would be very low. Use sample surveys and park administrative information would not be expensive to maintain. There is no reason why the annual costs of maintaining updated records of the size envisioned here for the entire

National Park System should be any larger than the costs of maintaining computerized records of medicaid users in New York City alone. The potential gain in improved planning and administrative efficiency would more than pay for the cost.

Chapter 3

PUBLIC VERSUS PRIVATE RESPONSIBILITY FOR RECREATION

THE USE OF PRIVATE SECTOR RESOURCES

Given the very rapid growth in demand for recreation services, "it is obvious that the public sector cannot continue to provide areas and facilities at the present rate."¹ While setting aside land for recreation areas must remain the responsibility of the different levels of government because of the "uncapturable" externalities that bedevil the land market, the development of these areas as effective recreation centers must be increasingly performed by both the public and private sector.

This mixed approach to meeting recreation needs must, of necessity, result in a radical change in the way in which recreation sites are administered and financed. Visitor levels and costs needs have reached levels at which recreation can no longer be regarded as a free good. Increased reliance must be made upon business skills in administering sites; users of expensive facilities must expect to pay at least part of the costs of their actions; free access by automobile must be severely curtailed. These actions are not necessary simply to limit the government's monetary responsibility toward meeting public recreation needs, but are essential because of the scarcity of land and the level and distribution of population.

Budget Inflexibility

One of the very real constraints upon the development of a public recreation facility is the relative inflexibility of the budget. Whereas the manager of a small business can adapt plant capacity or production techniques to reflect changes in market indicators--the level of demand for output or the prices of important factors--recreation planners and administrators are in a much less responsive

¹Styles, in B. L. Driver, op. cit., p. 51.

position. There are no local bank managers willing to make loans to purchase new machinery; nor are there dealers through whom equipment and inventories can be liquidated. Instead, a recreation project faces a relatively inelastic budget which can only be extended with a great deal of political negotiation. Therefore, to extend the quality and quantity of recreation services that are available at a given location, new ways of providing those services must be developed within the constraints of a fixed budget.

One aspect of budget inflexibility that is often overlooked by analysts is that there is inflexibility *within* the budget between alternative uses. Money allocated for an internal bus linkup cannot easily be diverted to the construction of a rest room.

It is probably fair to assert that, apart from being inflexible, the planning and operating budgets for most recreation areas are too small. They are too small in the sense that the annual value of the additional services that could be generated by the expenditure of another \$10,000 a year is probably considerably in excess of \$10,000. The dramatic increase in visitors per park employee and the ensuing decline in maintenance, repair and visitor services are well documented.²

One potential solution to the perpetual administrative problems of insufficient funds and inefficient use of them and the inability to enter the private capital market directly is to mobilize the private sector.

A park provides an excellent location for a wide variety of activities, ranging from camping to canoeing to horseback riding to eating. Yet development of these facilities requires capital funds. In addition, the administrator faces the problems of providing for the transportation needs of his visitors; parking lots, access roads, and bus and railroad link-ups.

²See *Staffing in the National Park System*, Office of Planning and Program Policy, National Park Service, March 1975.

Economies of Scale

Shortage of funds is not the only force that causes an administrator to look elsewhere for money and expertise. For many of the operating functions in a recreation area there are substantial economies of scale that could not be captured at the level of operations within a recreation site, but which could be captured by a private company for which the park was simply one area of operations. These economies may be due to the level of managerial skill required, or more probably, the benefits from specialization of tasks that a large operation can enjoy.³

The existence of potential economies of scale is a vitally important consideration in deciding whether to turn to the private sector, but it remains surprisingly difficult to identify and measure empirically. A high degree of judgment, based upon experience as well as the records of past performance, is necessary to determine whether a low bid for the provision of a service reflects a particularly efficient private operation or simply one that reduces costs through reducing quality.

The planner must decide, first, whether a particular program or project is worthwhile and, second, how necessary financial resources can be mobilized. Should the costs be met from the budget, or should private concessions be considered? The following section contains a brief analysis of the principal areas in which private resources might effectively be mobilized to provide services and facilities in a public recreation area.

Wherever possible, the decision to use private resources should be based upon a comparison of benefits with costs. While the budgetary problems enumerated above imply that costs and benefits cannot be the sole guide, the cost benefit framework provides a valuable business guide.

³The pin factory described by Adam Smith 200 years ago still remains the clearest example of these scale economies.

For too long, a park has been seen as a self-contained planning entity. The form of a park has been dictated by geological and biological criteria. In addition, park planners have not considered experiences in reaching the park. Only recently have the problems of planning for the full recreation experience been enumerated, and hopefully the new focus will lead to a fruitful resolution of some of the basic issues. The symptoms of the difficulties that have resulted from partial planning provide some insight into the direction in which research and development must proceed:

- o Increased urbanization has pushed more and more people to where there is no recreational open space. Central city dwellers have limited transportation resources and face high costs in reaching parks.⁴
- o Recreation areas are forced to divert more and more space for the "non-recreational" purpose of access roads and parking spaces.
- o Congestion in and near some national parks has reached a level that has a harmful effect on the recreational experience.
- o Motor vehicles at high levels of concentration are having a harmful effect on the environment in recreation areas--increasing soil erosion, causing toxic water run-off, and creating significant levels of air pollution.

TRANSPORTATION TO THE RECREATION SITE⁵

The private car carries 75 percent of all visitors to national parks. The solution to the ensuing crowdedness is not simply to

⁴This issue is addressed in more detail in Chapter 4.

⁵The author is grateful to Richard Bowser of the National Park Service for many helpful remarks. However, this section should not be construed as reflecting Mr. Bowser's views or those of the National Park Service.

build more parks, more parking lots and more roads. A new approach must be tried, an approach based upon the realization that the private motorist does not pay the full social cost of his activities. He does not compensate the farmer for the crops damaged by the oil and particulate laden run-off from the road he drives along; he does not compensate the bronchitis sufferer for his aggravated cough; he does not compensate the homeowner near the freeway whose sleep he disturbs; neither, at the margin, does he compensate other road users who are slowed down when he uses the road at rush hour. It is in society's interest to persuade or legislate the motorist out of his automobile into other forms of transportation for which the social costs are less acute. For example, if the noise, air, and land pollution and congestion costs resulting from a motorist are \$5 for a particular trip, and if the motorist can be persuaded with a "free" \$2 bus ride to use a bus, then society is better off.

The Road Traffic Act of 1974 specifically provided for research into the use of public transportation for recreation access. Park planners can save valuable space and development costs by minimizing the extent of automobile facilities. How the transportation needs of recreationists might best be met is, therefore, of prime concern in the planning and development stage of a new facility. An integral part of this concern is the decision to use, or not to use, the services of private transportation companies.

Efficiency is not the only reason for seeking to improve public access to recreation areas. In order to provide the economically disadvantaged with an opportunity for visiting public recreation areas, public transportation must be provided. Few urbanites own automobiles. Only 5 of the 56 regional recreation sites in the Pittsburgh metropolitan area are served by public transportation.⁶

Discouraging Automobile Use

There are two aspects to the provision of public transportation link-ups. First, deterring the use of the private automobile and, second, establishing the appropriate public services.

⁶*Urban Recreation*, Department of Housing and Urban Development, November 1973.

Automobile use can be deterred in two ways. First, the quantity of parking spaces can be limited. Second, the price for parking facilities can be raised. A brief analysis suggests that a mixture of both methods is appropriate and that the prices charged should vary according to the probable demand.

Restricting the availability of parking spaces is desirable inasmuch as it leaves more space for proper recreational uses of land. However, there are two potential problems. First, unless care is taken to coordinate the development of parking facilities with the local communities, local farmers may open their fields to motorists as parking lots, and the purpose of the restrictions within the park is lost. Regulating parking can be achieved through local zoning boards, but will also involve considerable enforcement costs. It is unfair for local residents to pay for the costs of policing visitor parking in their communities. The most equitable solution would be for part of the parking charge revenues to be used to provide such police services as ticketing illegally parked automobiles and collecting fines. Failure to take these needs into account will result in roads congested with parked cars, deteriorated fields, and considerable local anger.

The second problem with limiting parking through quantity restriction alone is that it leads to non-priced rationing of parking spaces. Spots will be available on a first-come-first-served basis, which will lead to long early morning lines of recreationists and turnaways, which causes anger and harassment of both visitors and park personnel alike.

By using prices as a way of equating the number of spaces with the number of visiting automobiles, planners can solve this latter problem (although, importantly, not the former). If, at a given parking fee, turnarounds still occur, then the correct solution is either to extend the number of spaces or to raise the entrance fee. The revenue generated can be applied toward the cost of policing parking in surrounding areas as well as toward the costs of providing an alternative public transportation service.

High parking fees and extensive public services should be used in proportion to the extent of the congestion problem. On off-peak days, when the demand for parking spaces falls short of the number available, a low fee should be charged (enough to cover the collection expenses and the operating--but not the capital--costs of the limited public services offered). Establishing effective pricing in this area requires knowing the demand for park visits in the form described in Chapter 2 above.

One important point should be made. The appropriate parking fee at a particular park depends upon the conditions at that park--the capacity of local roads, the level of demand, and the number of parking spaces. There should not be a uniform fee for all parks in a region, or even in a local area. In fact, the fees can be used to change the distribution of visitors *between* different parks in order to minimize the congestion costs and create the most efficient use of recreation opportunities. For illustration, consider a household that values, at current admission and parking fees, a visit to highly-congested Park A at \$10 and to less-congested Park B at \$9. If there are no additional fees, that household will visit Park A. If the relative price of a visit to Park A is raised by more than \$1 more than the price of a visit to Park B, then the household will switch to Park B.

Popular pressure against parking fees is likely to be defused if the fees are accompanied by the provision of public transportation services. Households would have the alternative of using buses or trains instead of paying the higher fees.

Providing Public Transportation

It has already been argued that there are firm arguments in favor of subsidizing the operation of public transportation services to recreation areas. The private transportation sector cannot be expected to provide these services without financial and planning guidance. It has also been stated that the level of services should vary according to the demand for park visits. This means that it is probably not cost-effective for the Park Service to purchase the

necessary equipment, since much of it would be idle for part of the year. Idle machinery means that the capital cost per hour of use is increased. By leasing the equipment or renting the service from a private supplier who will be able to spread capital costs over many more use hours per year, the equipment cost can be reduced.

The same is probably true of the manpower and facilities needed to operate the buses. There are considerable fixed administrative costs associated with hiring bus operators that would raise their cost per trip above that of private operators. Unless a number of operators could be used full time, it is doubtful whether the Park Service could compete with the private sector.

Where should these buses and operators be drawn from? What form should the contract between the Park Service and the private companies take? One untapped source of transportation equipment and personnel on weekend days is the massive commuter capacity in metropolitan areas. A considerable part of the facilities needed five days a week to carry urban workers from their homes to work and back again are idle on weekends. So, too, are hundreds of school buses. Local authorities could reduce their own operating costs by contracting to provide transportation along predetermined routes to recreation sites.⁷ At the same time, the Park Service would be able to avoid most of the capital costs and manpower problems. Even during the week it might be possible for the Park Service to use the municipal organization and to finance the equipment and personnel necessary for the few trips to the recreation area. Providing that the rate paid by the Park Service exceeded the marginal cost of the service, the transit authority would probably be amenable to providing services. This arrangement is in contrast to the situation at the turn of the century in many large urban centers. Because of the possibility of idle buses on weekends, owners of early mass transit systems developed recreation facilities, subsidized from fare revenues, and were able to regain their investment from weekend fare collections.

⁷ Mt. McKinley National Park already uses school buses for transportation to and within the park. It is fortunate inasmuch as its short summer season corresponds exactly to school summer vacations.

If the demand for transportation equipment and manpower for recreation routes at any time exceeds that which can be supplied from municipal systems, then the Park Service must turn to private bus companies. In this area the issue of the type of concession agreement becomes important. Municipal transit systems (unless they are privately owned) are likely to provide a service on the condition that they are paid a certain subsidy for each route that is covered (on top of the value of the fares that they collect). For many of the longer routes, private companies are likely to make similar requests. However, for some recreation areas⁸ within or quite close to large cities, where the form of the passenger routes is less clear, an alternative concession scheme might be attempted that would provide an incentive to the operator to select the most efficient routes. This would involve paying passenger carriers a subsidy *per passenger* that would vary according to the distance carried. For example, a passenger carrier could be allowed to charge passengers to Gateway from Brooklyn and Queens 25 cents, and passengers from Manhattan and the Bronx 50 cents. The carrier would receive a subsidy of 20 cents for each of the former, and 40 cents for each of the latter. He would then face an incentive to run an efficient route and even to advertise for passengers. The rate of subsidy and the prices charged would have to be determined experimentally. The results of each tariff would have to be carefully monitored to ensure that they were not so high as to create wasteful competition for passengers in some areas or so low as to deter passenger carriers. The problem is severe enough to merit consideration of a broad variety of alternatives.

Funding for the transit subsidy should not come from National Park Service funds alone. UMTA funds, which up to now have been used only for work commuting systems, should be used for recreation transit systems as well. A solution to the growing problems of recreation traffic control will be developed sooner by establishing a series of demonstration projects now.

⁸ Particularly large urban parks situated at the edge of extensive areas of high density settlement, like the Gateway National Parks in San Francisco and New York.

TRANSPORTATION WITHIN THE SITE

Once visitors are deposited at focal centers of the park--perhaps visitors' centers or parking areas--it is necessary for them to be distributed throughout the park so they can enjoy the recreation facilities and activities of their choosing at the minimum level of inconvenience to themselves and other park users.

The automobile has the advantage inasmuch as the visitors can use it to drive themselves and their recreation equipment to the location of their choosing. A bus, on the other hand, represents a relatively inconvenient mode which must be shared with many others and into which must be crowded the voluminous accoutrements of a family's day in the park. However, the automobile has certain disadvantages. The motorist may not know a park particularly well and must drive around for some time to find a spot that attracts him. The automobile must be parked in a legal spot once a site has been selected. Through the provision of special bus services (having the appropriate amount of luggage space) together with maps and guidebooks, the motorist can be relieved of these problems.

It is unlikely that a motorist can be diverted simply by the availability of transportation within a park. Instead, it will be necessary to restrict the areas to which private automobiles are allowed access. Relatively limited roads throughout the park would be constructed for special bus services, operated by the NPS, which would be used to distribute visitors at recreational sites. This would allow attractive sites to handle more people (since there would be fewer roads and parking areas) and to minimize damage to vegetation, air and noise pollution, and other problems.⁹

Maps can be provided for the visitors so that they can select their stopping-off point as they ride the bus.

Because of the special nature of the vehicles necessary for this type of duty, it is unlikely that they can be leased from the private

⁹ Park administrators will also gain daily information on the distribution of visitors within the park as an aid to determining which sites should be expanded.

sector. They must be owned and operated by the NPS. However, attempts should be made to coordinate needs on a national, rather than a local, basis. Since peak visiting days (when all such buses at a park would be fully used) are not the same for all parks, buses and personnel could be shifted between parks according to need.

FIRE PROTECTION SERVICES

A recreation area needs fire-fighting services, both to protect the natural environment and to protect the buildings and facilities.

For many of the large, remote parks, equipment for this purpose must be developed and maintained and personnel must be housed within the park. However, for those parks situated near cities or towns, there is the alternative of using the municipal fire department. At present, there are no contractual arrangements through which the NPS can compensate a municipality for expanding its facilities to protect the park. Municipalities may offer a source of such services that is cheaper than constructing a duplicate service within the park.

An analysis of the costs of the two alternative schemes should be made on a park-by-park basis. The experience within many of the existing parks could provide the necessary data base. The appropriate level at which fire protection should be available can only be assessed by using information relating the costs of losses to both federal and concessionaires' property within parks. At present, such data are unavailable. They should be made available on an annual, or even quarterly, basis so that fire protection planning can be carried out efficiently and quickly.

MEDICAL FACILITIES

Recreationists have accidents--in automobiles on the way to the park and while participating in recreation activities. There is the burden of providing for additional emergency and hospitalization facilities. As with fire protection, no channels currently exist through which the NPS can compensate local municipal or private hospitals for the additional capacity necessary for meeting the needs

of a busy recreation area. The failure to create the appropriate compensatory mechanism has resulted from the belief that the value of the recreation area to the local community, in terms of higher property values and increased retail trade, outweighs these costs. As was argued in Chapter 2, this attitude ignores the very real transfers between local groups. A more equitable approach would avoid these discrepancies and lead to more efficient and beneficial interaction between the NPS and local groups during both the planning and the operating stages of the park.

OTHER SERVICES

Many specialized recreation facilities--canoe rides, tennis courts, swimming pools, etc.--and many supplementary services--restaurants, shops, equipment rentals, etc.--can be developed with private funds rather than with scarce public funds. The park planners and administrators must ensure that the type of private development is compatible with the overall development of the park. Facilities must be situated in accessible spots which will not cause congestion or damage to vegetation. Various types of arrangements are possible.

a) The NPS can construct the facility and lease it to private companies to operate. This approach saves scarce manpower for the more specialized visitor services and park maintenance for which NPS personnel are best suited. In view of the already-noted understaffing of many parks and the political difficulties associated with increasing the staff level, this arrangement has obvious advantages. However, it still places upon the NPS the responsibility for planning facility construction and determining the pricing system.

b) Land can be leased to a private business for development and operation of a restaurant or sporting facility. The private sector, being much more responsive to market signals, is more likely to plan and operate the facility efficiently. The NPS can protect the area by including buy-back clauses in the lease and by providing only short-term leases. In this way, development is financed by private

capital, and NPS funds can be used for the park itself. The lease income can be used to improve maintenance and to finance additional services.

There are difficulties with this approach, however. Efficiency is only one of the goals of those charged with providing recreational amenities. Leasing a restaurant site in a national park in a particularly attractive location may lead to the development of a luxury restaurant which serves only a small fraction of the visitors. Equity demands that lower-income groups also have access to eating places. The NPS must plan to meet their needs as well.

It is also necessary to determine the appropriate annual lease for the land. Ideally, this should be done competitively, with the operating rights being awarded to the highest bidder. However, the amount that can be paid to the NPS depends upon the price of the building. This would create a problem of three parties--the present owner-operator, the prospective bidder, and the NPS. A buy-back provision also requires the setting of a fair price--and experience with this procedure has not been satisfactory.

c) The last alternative is for the NPS to sell outright a plot of land for development and to collect an annual property tax payment in much the same way as a municipality does. Control of development could be maintained through zoning ordinances.

This would involve a fairly dramatic break with past tradition and also an extensive legal framework.

The merits of the alternatives outlined above clearly cannot be determined a priori. An extensive evaluation of the NPS's experience with private concessions and with operating its own facilities is clearly needed. The costs and benefits of the different arrangements must be evaluated. Unfortunately, the appropriate data for such a review are not readily available. A file for easy access and review should be started. When one is assembled, a multi-disciplinary examination should be performed, using the talents of lawyers, economists, business managers, and park service personnel.

CONCLUSIONS

The limited financial and staffing resources of the NPS, coupled with the dramatic increase in visits to national parks, dictate that a new approach to the financing and operating of recreation sites be developed. Data are needed for a detailed understanding of individual cases and problem areas. A number of general conclusions are possible, however. These are summarized below.

First, a park cannot be considered as a separate geographic unit. The land around a park must provide many of the support services for the area. Before deciding whether to include campsites, restaurants, hotels, and other facilities within a park, the possibility of their provision in adjacent areas must be considered. However, the cost of not leasing land for a restaurant at a net profit of \$50,000 per year within the park represents a potential loss of income to the NPS. The land must be worth at least that amount in its alternative use (net of any indirect costs that the restaurant may impose) to justify, at first glance, the exclusion of the restaurant. Planning must be based upon a knowledge of these costs and benefits.

Second, park managers must increasingly rely on business management skills. At present, all revenues from a park disappear into the U.S. Treasury. A park manager faces no incentive, either in terms of his own salary or in terms of expenditure upon his park, to regulate development and use efficiently. In fact, there is an implicit incentive toward allowing a park to become overused since an increase in the number of visits may lead to increased budget appropriations.

It is imperative that the financial procedures within the park service be changed. If a parking fee system is instituted, the manager should be able to use the receipts to subsidize public transportation services. It is unfair to expect the federal agencies to respond to the rapidly changing local needs either as fast or as effectively as the local manager. If sports facilities are constructed by the private sector, then the income from the concessions should be used to provide for the increased maintenance that the more intensive use will entail. The days are gone when the National Park Service and the National Forest Service were in the business of simply

preserving natural environments. The full recreation needs of the urbanized American population must be considered. Land resources are scarce, and only if recreation areas are used efficiently can the demands for recreation be met.

Third, the system, private leases and concessions, by which private resources are mobilized to assist the NPS must be examined. Different activities and planning horizons will require different types of arrangements.

Fourth, pricing can be used as an effective rationing tool. This is particularly true for automobile access, where the revenue from parking and entrance fees can be used to subsidize alternative and, from society's viewpoint, less costly means of transportation. If this is done, the main objection against user fees--that they discriminate against those with low incomes--is overcome.

But fees can also be used to regulate the volume of users, especially during peak days. Free or nominally priced admission to a park is a short-sighted policy. It results in excessive consumption today and inadequate resources tomorrow. If recreationists knew that their fees were used to expand recreation facilities as need arose, much of the opposition against fees would disappear.

Finally, cooperation between federal agencies responsible for recreation must be increased. The Department of Transportation must be involved, both financially and through staff planning, in making recreation areas accessible. The Department of Housing and Urban Development must share responsibility in urban areas. The Department of Health, Education and Welfare should be important in developing special programs to ensure that the maximum benefit is enjoyed by the broadest spectrum of society. The Economic Development Administration, which finances recreation projects as part of public works schemes, should coordinate its plans with the NPS. The extensive programs of both the National Forest Service and the Army Corps of Engineers should also be developed within an overall system of recreation planning. The Bureaus of the Census and Labor Statistics should be used in coordination with the Bureau of Outdoor Recreation to gather data

for rational planning. Federal, state and local authorities must also meet to get the best results from available resources.

Effective planning will not be possible while responsibility for recreation is spread among so many departments and levels of government. Some agency must assume the overall responsibility and acquire staff to meet this task. Its past experience and its growing involvement with many aspects of recreation suggest that the National Park Service would be the appropriate agency.

Chapter 4

RECREATION IN AN URBAN SOCIETY

Demand for recreation facilities is growing much more rapidly than the supply. This imbalance is reflected in the traffic congestion in the Sequoias, the three-hour waits for tennis courts on Saturdays, the rapid erosion of Central Park, and the skyrocketing prices of vacation homes. There has been little attempt to tackle the problem methodically. The Department of Housing and Urban Development concluded in 1973 that "public outdoor recreation policies and programs have not changed with the speed of social change" and that "expenditures for recreation are spread across a number of federal agencies and there exists no mechanism or policy for coordinating these effects or directing a suitable proportion of the overall efforts to densely-populated communities."¹

Some indication of the dimensions of the problem can be gained from an overview of recent mismatched trends in population distribution and availability of outdoor recreation services. Between 1950 and 1970 the population of large metropolitan centers (SMSAs) rose from 94.6 million to 139.4 million, the latter representing nearly 70 percent of the nation's population.² Each additional urban dweller has been estimated to result in the destruction of 1/4 acre of natural environment. As metropolitan areas swell in size, the accessibility to open space is pushed further away from those living in the central city.

Central-city people are the least equipped to meet their own outdoor recreation needs. Many live in apartments in areas of high residential density. Forty percent of the households are without

¹*Urban Recreation*, Department of Housing and Urban Development, Washington, D.C., p. 5.

²U.S. Department of Commerce, *U.S. Statistical Abstract*, 1973.

automobiles, compared with only 20 percent in suburban and rural areas. Only 22 percent have more than one automobile. Yet more than three-quarters of the visits to those parts of Gateway National Park within New York City³ were by automobile. For most areas outside cities, all but 2 or 3 percent of the visitors arrive by automobile. In a study of Pittsburgh, a HUD research group found that only 5 of the 56 regional recreation sites were accessible by public transportation.⁴

The result is that recreationists tend to be from middle- or upper-income groups. Table 7 shows the distribution of participants in selected outdoor recreation activities. While those with incomes below \$8,000 constitute 45 percent of the population, they make up less than 40 percent of the participants in all the listed activities (with the exception of hunting). The reverse is true of middle- and upper-income groups. The urban poor tend to be concentrated in central cities, which implies a higher price for access to most forms of recreation. Whether these lower participation rates are due to income differences or differences in the cost of access is unclear. In one small test of participation rates in an urban area where accessibility to a recreation area was easy, the participation rates were found to be similar for all income groups.⁵

The demand for open space is increasing not only because of the growing urban population, but also because of rising incomes, increased leisure time, and a growing taste for the pleasures of recreation. Boyet and Tolley (op. cit.) found that demand for visits to selected National Parks grew proportionally to population, but at nearly twice the rate of growth of income. This implies an almost 10 percent annual growth rate in demand for recreation services. Fisher (1961) predicted a tripling in the demand for open space between 1960 and 2000.

³ Riis Park, Jamaica Bay, Great Kills.

⁴ HUD, op. cit.

⁵ John L. Lindsay and Richard A. Ogle, "Socioeconomic Patterns of Outdoor Recreation Use Near Urban Areas," *Journal of Leisure Research*, Vol. 4, No. 4, 1972, pp. 19-24.

TABLE 7
PERCENT OF POPULATION AND PERCENT OF PARTICIPANTS IN
OUTDOOR RECREATION ACTIVITIES BY INCOME GROUP
(JUNE, JULY, AND AUGUST 1972)*

	Family Income		
	Under \$8,000	\$8,000- \$14,999	\$15,000 and over
U.S. Population	45	45	23
Camping in remote or wilderness areas	32	45	23
Camping in developed camp grounds	27	49	24
Hunting	43	38	18
Fishing	38	44	18
Riding motorcycles off the road	35	38	26
Wildlife and bird photography	27	42	32
Bird watching	33	44	22
Hiking with a pack/rock/mountain climb	28	48	24
Nature walks	30	46	24
Walking for pleasure	35	43	22
Bicycling	27	44	28
Horseback riding	29	39	30
Water skiing	21	44	35
Canoeing	27	45	28
Sailing	15	34	51
Other boating	26	44	29
Outdoor pool swimming	27	46	26
Other swimming outdoors	29	44	26
Golf	13	41	47
Tennis	22	41	37
Playing other outdoor games or sports	31	47	23
Going to outdoor concerts, plays, etc.	29	43	29
Going to outdoor sports events	33	46	21
Visiting zoos, fairs, amusement parks	32	47	22
Sightseeing	34	41	23
Picnicking	36	41	21
Driving for pleasure	35	41	21

SOURCE: Bureau of Outdoor Recreation, 1972 National Recreation Survey, Appendix A, p. 14

* Percents may not add to 100 due to rounding error.

Visits to State and National parks grew 440 percent between 1950 and 1970, while population grew by only 34 percent.⁶ The number of acres in the system grew even more slowly, by only 32 percent.⁷ The intensive use has led to rapid increases in expenditure, from \$70 million to \$530 million over the same time span, or 564 percent in constant dollars. Staffing has not expanded at a comparable pace with the number of visitors. In 1960 there were 26.9 thousand visits per staff employee to National Park Service areas. By 1974 the total had reached 44.5 thousand visits. The result is an inevitable decline in the quality of recreational services, a dramatic underinvestment in maintenance facilities, and deterioration in the parks themselves.

By far the heaviest burden for the supply of recreation services falls upon cities. Municipal governments now spend over \$2 billion dollars annually, compared to a little more than half a billion by state governments and just over \$200 million by the National Park Service. For each level of government the share of recreation expenditure in the total budget has fallen over the 20 years.

In fiscally beleaguered cities, recreation budgets are among the first to be cut. Surveying an ill-designed park in New York City, Parks Administrator Edwin Weisl said, "I don't have the money. I can't even buy toilet paper."⁸

Just as the distribution of open space between city and rural areas is imbalanced, so is the distribution between states and regions. The National Park Service acreage is heavily concentrated in the Pacific and Mountain regions, while population is concentrated in the Middle Atlantic and East, North, and Central areas. Cities differ between themselves as to the availability of open space for recreation opportunities. Table 8 shows some relevant data concerning recreation availability in a number of cities.

⁶U.S. Department of Commerce, *U.S. Statistical Abstract*, 1974. Population grew from 151.3 to 203.2 million, while park visits grew from 150 to 660 million.

⁷From 28 to 37 million acres.

⁸*New York Post*, September 19, 1974, p. 2.

TABLE 8
MUNICIPAL PARKS - AREAS, EXPENDITURES, AND EMPLOYEES
SELECTED CITIES: 1960 AND 1970

CITY	PARK AREAS		TOTAL EXPENDITURES		PAID EMPLOYEES		POPULATION		ACRES PER 1000 INHABITANTS	EXPENDITURE PER 1000 INHABITANTS	EXPENDITURE PER ACRE				
	Acreage		(mil. dol.)		Total		(thousands)								
	Number	1960	1970	1960	1970	1960	1970	1960	1970	1970	1970				
Atlanta, Ga.	153	163	2,500	2,510	3.6	8.1	430	1,177	282	621	487	497	5.0	16.3	3.2
Birmingham, Ala.	66	63	1,256	1,500	1.0	3.3	372	556	229	277	341	301	5.0	11.0	2.2
Boston, Mass.	250	366	2,700	6,900	3.1	17.0	1,095	900	675	600	697	641	10.8	26.5	2.5
Dayton, Ohio	59	82	1,800	2,302	2.2	3.8	472	543	187	207	262	244	9.4	15.6	9.4
Denver, Colo.	148	(NA)	15,927	16,686	2.2	5.6	785	744	294	296	494	515	32.4	10.9	0.33
Detroit, Mich.	363	394	5,831	5,954	10.3	19.1	2,484	2,773	1,223	1,240	1,670	1,511	3.9	12.6	3.20
Houston, Tex.	133	225	4,454	4,762	3.3	5.3	670	713	400	610	938	1,232	3.9	4.3	1.11
Kansas City, Mo.	89	115	3,992	7,855	2.8	6.5	594	933	353	439	476	507	15.5	12.8	0.8
Los Angeles, Calif.	166	784	11,224	15,947	16.7	41.7	6,492	12,363	1,722	2,034	1,479	2,816	5.7	14.8	2.61
Louisville, Ky.	110	259	4,100	6,513	1.2	(NA)	747	2,060	157	360	391	361	18.0	--	--
Memphis, Tenn.	115	163	3,748	4,981	2.8	7.3	1,172	2,355	415	504	498	624	8.0	11.7	1.46
Milwaukee, Wis.	246	329	10,950	14,264	(NA)	(NA)	2,812	3,792	941	1,129	741	717	19.9	--	--
Minneapolis, Minn.	153	(NA)	5,533	(NA)	4.2	11.2	1,740	1,004	650	449	483	434	--	25.8	--
Newark, N. J.	40	59	42	137	1.5	(NA)	929	434	187	109	405	381	0.4	--	--
New Orleans, La.	121	146	1,708	2,300	1.5	1.3	348	788	255	169	628	593	3.8	2.2	0.56
Norfolk, Va.	50	130	977	1,971	1.3	2.2	203	602	116	363	306	308	6.4	7.1	1.12
Oakland, Calif.	101	145	2,706	2,017	3.5	6.5	1,122	1,175	316	325	368	362	5.6	18.0	3.22
Okla. City, Okla.	62	128	2,732	3,692	.9	3.5	420	754	166	360	324	366	10.1	9.6	0.94
Philadelphia, Pa.	279	330	9,368	9,822	12.7	29.4	2,641	2,475	1,658	2,174	2,007	1,949	5.0	15.1	2.99
Phoenix, Ariz.	123	341	20,380	18,696	1.9	5.2	635	955	175	359	436	581	32.2	8.9	0.28
Portland, Oreg.	125	236	7,109	7,588	3.4	6.2	592	850	393	417	373	383	19.8	16.2	0.81
Rochester, N. Y.	36	33	2,077	2,209	2.5	3.2	432	589	162	229	319	296	7.5	10.8	1.45
San Antonio, Tex.	61	68	3,000	4,455	1.8	3.8	1,049	2,872	278	444	588	454	9.8	8.4	0.85
Seattle, Wash.	104	253	3,500	3,834	2.9	13.0	645	1,126	469	583	557	531	7.2	24.4	3.39

SOURCE: National Recreation and Park Association, Washington, D.C., unpublished data.

(NA) - Not Available

*Year-round

Research in the area of recreation has received relatively little systematic funding. The Outdoor Recreation Resources Review Commission (*Report No. 21*) in 1962 recommended the institution of a "systematic and continuing program of research ... to provide the basis for wise decisions and sound management." In 1968, the National Academy of Sciences conducted a study conference on outdoor recreation research. It estimated that only \$3 million of federal funds were directed toward recreation research and that only a small portion of this was in the area of social and economic analysis. This compares with a research investment by General Motors in the development of the catalytic converter of over \$100 million.

What are the causes of this neglect of both facility development and research and development of more efficient ways of delivering recreation services? The finger has been pointed in many directions. Some observers have blamed the work ethic in North America, with its implicit belief that recreation is a "luxury" good. During the rapid urbanization of American society, attention was focused upon attracting industry and commerce, while the environment of the city as a home for the growing numbers of employees was all but ignored.

The heterogeneous nature of American urban society, fed by massive emigration from many European nations and from many races, aggravated the problems. In 1868, the *New York Herald* expressed reservations about the feasibility of urban parks.

It is folly to expect this country to have parks like those in old aristocratic countries. When we open a public park Sam will air himself in it. He will take his friends, whether from Church Street or elsewhere. He will knock down any better dressed man who remonstrates with him. He will talk and sing and fill his share of the bench and flirt with the nurserymaids in his own coarse way. Now, we ask, what chance have William B. Astor and Edward Everett against this fellow citizen of theirs? Can they and he enjoy the same place?

The fragmented structure of local government in large urban areas conspires against a rational solution to the problem of meeting recreation needs. A large city is reluctant to invest in the construction

of extensive recreation facilities when suburban communities will reap many of the benefits without paying the costs.⁹ State governments, until recently, have been traditionally antipathetic toward the needs of their largest cities. Suburban governments are unwilling to provide facilities that would attract members of those population groups that their constituents moved to get away from. The Advisory Committee on Intergovernmental Relations summarized the governmental disorganization with respect to recreation.

Local government activity has been marked by economic competition, exclusionary zoning and building code anarchy. State governments usually have been indifferent to urban financial and service needs, and rarely willing to challenge the local government status quo. The federal role has been wholly contradictory. On the one hand, Congress enacts area-wide planning requirements strengthening representative regional bodies, adopts programs to assist the rehabilitation of central cities. On the other hand, the Federal-State Highway Program, the Federal Housing Administration's activities, the failure of a fair and uniform relocation policy and various decisions of the Department of Defense and other federal agencies more often than not have collided head-on with long-term urban development needs.

As the road to the present urban hell was paved, many major sins of omission and commission can be ascribed to the states. Cities and suburbs, counties, townships, and boroughs alike are, after all, legal creations of the state. The deadly combination of restricted annexation and unrestricted incorporation: the chaotic and uncontrolled mushrooming of special districts; the limitations upon municipal taxing and borrowing powers; the deliverance of the all-important police powers of zoning, land use and building regulations into the hands of thousands of separate and competing local governments--these are but a few of the by-products of decades of state government nonfeasance and malfeasance concerning urban affairs.¹⁰

⁹The fiscal exploitation of central cities by suburbs has received considerable documentation. One of the most thorough is William B. Neenan, *The Political Economy of Urban Areas*, Chicago, Markham, 1972. The HUD report on Urban Recreation cites the example of Newark, where, between 1960 and 1968, state and federal tax revenues increased by \$200 million, while state and federal grants-in-aid to the city rose by only \$25 million.

¹⁰Quoted in HUD, op. cit., p. 33.

Perhaps equally important in explaining the neglect of recreation has been a failure to explore what recreation means. Recreation covers the entire range of leisure time activities, from watching a movie to taking a raft down the Colorado River. Many recreation demands are met by private industry--bowling alleys, Broadway shows, skiing, and golf are mostly carried out in privately-owned facilities. Federal and local governments have assumed responsibility for outdoor recreation because of the existence of costs and benefits from such activities that are external to the activities themselves.¹¹ For example, setting aside land as a park or a recreation facility can have a significant impact on the character and development of the surrounding communities, and readily available recreation opportunities may reduce the propensity toward crime and vandalism of the participating groups. Yet planning for outdoor recreation must be more than allocating a given number of acres. All acres of open space are not homogeneous, any more than are all two-bedroom apartments. The recreation services that an acre of park provides depend very heavily upon its location and its design and the facilities that it embodies, just as the value of a two-bedroom apartment as a home depends upon where it is located and its design and the way it is equipped.

The emphasis that has been placed upon meeting target acreage has not had an entirely fortunate effect, even with assistance on meeting capital costs from the federal government.¹² For many cities this has meant straining limited maintenance resources beyond the point of efficient operation, so that a reduction in quality has more than cancelled out the value of the extra quantity.

In rural locations, the emphasis has been upon the preservation of natural areas rather than upon the development of recreation facilities. Yet in 1972 only 7.7 million people participated in camping in

¹¹See, for example, Roger J. Vaughan, *The Economics of Recreation: A Survey*, P-5301, The Rand Corporation, September 1974, and John C. Weicher and Richard H. Zerbst, "The Externalities of Neighborhood Parks: An Empirical Investigation," *Land Economics*, Vol. XLIX, No. 1, 1973, pp. 99-105.

¹²Through the Open Space Program, administered by the Department of Housing and Urban Development.

wilderness areas while 17.5 million camped at developed camping grounds.¹³ While 8.6 million people participated in hiking with a pack, 54.2 million went walking for pleasure and 74.4 million went picnicking. Numbers alone do not give the full picture, since they do not indicate the value that the participants placed upon the activity--however, it is probably fair to conclude that preservation of an area is not the only, nor even the best, way to meet the recreation demands of a population efficiently. Open space recreation needs can only be met when the full breadth and depth of recreation demands are considered.

The long-run effects of the neglect of recreation have not been measured and can only be guessed at. The National Advisory Commission on Civil Disorders reported in 1967 that inadequate recreation facilities ranked fifth (immediately after the neglect of education) as a reason for discontent among urban blacks. Because of the failure to provide an attractive menu of municipal services in large cities, households with high enough income move out to suburban areas where the environment is more attractive, leaving the city to the poor and the very rich. In New York City, 13 percent of the population exists at or near the poverty level; that figure is only 6 percent in the suburbs. Jobs have followed households to suburban locations where efficient single-floor plants can be constructed on relatively low-priced land. The federal highway program has reduced travel time by truck so that access to a freeway is now more important than access to a railroad station for most urban industries.

The economic basis for many large urban centers is changing, and the change has important implications for future recreation needs. The economies of agglomeration that were crucial in creating the manufacturing complexes around which many cities grew up have been wiped out by the advances in communications technology that allow separate productive functions to be carried out by plants separated by many

¹³From U.S. Department of the Interior, Bureau of Outdoor Recreation, *Survey of Outdoor Recreation*, 1972.

miles. Air conditioned plants have allowed the South and Southwestern regions to gain at the expense of the older and more established Northeastern region.

If older cities are to remain economically viable, they must turn to new economic activities to support their populations. They must become recreation and residential centers, containing theaters, museums, restaurants, nightclubs and housing--they may provide the type of concentrated personal and recreational amenities that sprawling suburbs cannot offer. There are many signs of this development. Many inner-city areas are rebuilding, erecting universities and high-income housing in previously desolate areas. Battery Point City and the South of Houston Street developments in New York City and the Lakefront development in Chicago are three examples.

This transformation can only be achieved if additional open-space recreation opportunities are made available. Old industrial areas, landfills, railroad air rights, old marine facilities and urban renewal areas are all potential sources for expanded urban open space. Cities themselves do not have the financial resources to purchase and manage these areas as recreation sites. Federal and state help will be necessary. Action is necessary now to grasp the opportunities that urban economic change presents. Failure will increase further the steady erosion of urban society that has already begun. Success could lead to a revitalization of city life.